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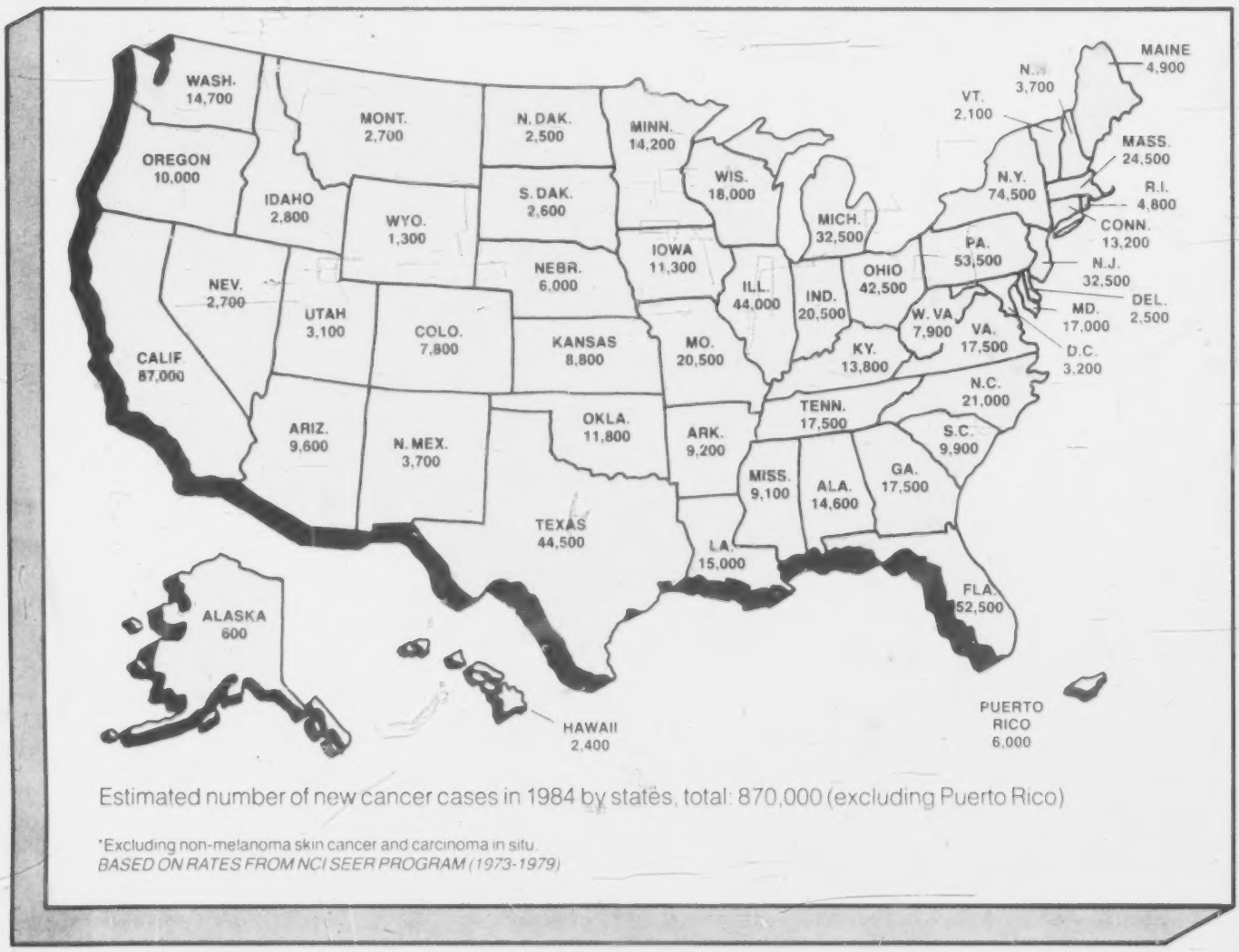
CANCER FACTS & FIGURES 1984

AMERICAN CANCER SOCIETY®



Estimated number of new cancer cases in 1984 by states, total: 870,000 (excluding Puerto Rico)

*Excluding non-melanoma skin cancer and carcinoma in situ.
BASED ON RATES FROM NCI SEER PROGRAM (1973-1979)

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BASIC DATA

What is cancer?

Cancer is a large group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled or checked, it results in death. However, many cancers can be cured if detected and treated promptly.

How is cancer treated?

By surgery, X rays, radioactive substances, chemicals, hormones and immunotherapy.

Who gets cancer?

Cancer strikes at any age. It kills more children 3 to 14 than any other disease. And cancer strikes more frequently with advancing age. In the 1970's, there were an estimated 3.5 million cancer deaths, over 6.5 million new cancer cases, and more than 10 million people under medical care for cancer.

How many people alive today will get cancer?

About 67 million Americans now living will eventually have cancer; about 30 %, according to present rates. Over the years, cancer will strike in approximately three out of four families.

How many people alive today have ever had cancer?

There are over 5 million Americans alive today who have a history of cancer, 3 million of them with diagnosis five or more years ago. Most of these 3 million can be considered cured, while others still have evidence of cancer. By "cured" is meant that a patient has no evidence of disease and has the same life expectancy as a person who never had cancer.

The decision as to when a patient may be considered cured is one that must be made by the physician after examining the individual patient. For most forms of cancer, five years without symptoms following treatment is the accepted time. However, some patients can be considered cured after one year, others after three years, whereas some have to be followed much longer than five years.

How many new cases will there be this year?

In 1984 about 870,000 people will be diagnosed as having cancer.*

How many people are surviving cancer?

In the early 1900's few cancer patients had any hope of long-term survival. In the 1930's less than one in five was alive at least five years after treatment. In the 1940's it was one in four, and in the 1960's, until recently, it was one in three.

Today, about 326,000 Americans, or 3 out of 8 patients who get cancer this year, will be alive 5 years after diagnosis. The gain from 1 in 3 to 3 in 8 represents about 40,000 persons this year. This 3 in 8, or about 39% is called the "observed" survival rate. The observed survival rate is the proportion of people alive 5 years after diagnosis of cancer. When normal life expectancy is taken into consideration (factors such as dying of heart disease, accidents and diseases of old age) 48% will be alive 5 years after diagnosis. This is the "relative" survival rate, and is considered a more commonly used yardstick to measure progress against cancer.

Could more people be saved?

Yes. About 148,000 people with cancer will probably die in 1984 who might have been saved by earlier diagnosis and prompt treatment.

How many people will die?

This year about 450,000 will die of the disease—1,230 people a day, about one every 70 seconds. Of every five deaths from all causes in the U.S., one is from cancer. In 1983 an estimated 440,000 Americans died of cancer. In 1982 it was 431,000; in 1981 the figure was 422,000.

What is the national death rate?

There has been a steady rise in the age-adjusted** national death rate. In 1930 the number of cancer deaths per 100,000 population was 143. In 1940 it was 152. By 1950 it had risen to 158 and in 1980 the number was 169. The major cause of these increases has been cancer of the lung. Except for that form of cancer, age-adjusted cancer death rates for major sites are leveling off, and in some cases declining.

Can cancer be prevented?

Some cancers, not all. Most lung cancers are caused by cigarette smoking, and most skin cancers by frequent overexposure to direct sunlight. These cancers can be prevented by avoiding their causes. Certain cancers caused by occupational-environmental factors can be prevented by eliminating or reducing contact with carcinogenic agents. Examples include bladder cancer among workers in the dye industry, and lung cancer in asbestos workers—especially those who are also smokers.

*These estimates of the incidence of cancer are based upon data from the National Cancer Institute's SEER Program (1973-1979). Non-melanoma skin cancer and carcinoma in situ have not been included in the statistics. The incidence of non-melanoma skin cancer is estimated to be about 400,000.

**Age-adjusted—a method used to make valid statistical comparisons by assuming the same age distribution among different groups being compared.

SOURCES OF STATISTICS

INCIDENCE

Since there is no national office which records every new cancer case, there is no way of knowing exactly how many new cases of cancer are diagnosed each year. In the past, estimates of cancer incidence were made by extrapolating from the experience of the few population-based cancer registries.

Estimates of incidence in *Facts & Figures* editions prior to 1974 were based on data from two state cancer registries. The issues from 1974 through 1978 used information from the National Cancer Institute's Third National Cancer Survey (1969-1971) of nine major areas of the United States.

Then in 1973, NCI began a new and larger program, gathering data from 11 population-based registries. It is called SEER, standing for Surveillance, Epidemiology and End Results.

Beginning with the 1979 edition of *Facts & Figures*, SEER incidence information has been used. Each time a new data base is introduced, there may be some sharp changes in figures, due to the more accurate data. The changes do NOT indicate either a cancer epidemic or miracle cure.

For valid comparisons between years, incidence statistics from the 1974 through 1978 editions of *Facts & Figures* may be compared with one another, while those from the 1979 and later editions may be compared.

The latest available information for this 1984 edition is SEER data from the years 1973-1979.

MORTALITY

The source for mortality statistics has remained constant over the years: the National Center for Health Statistics, Department of Health and Human Services.

The 1984 figures are estimates based on the latest available information, which includes mortality data through 1978.

Beginning with the 1981 edition of *Facts & Figures*, mortality rates per 100,000 population were age-adjusted to the 1970 census population, rather than the 1940 census population. Comparing these charts and figures with those of previous years may indicate false trends.

SURVIVAL

Because of the five-year waiting period, survival statistics take longer to compile.

Beginning with the 1982 edition of *Facts & Figures*, new information made it possible to compare 5-year survival rates for patients diagnosed in the early 1970's (1970-73) with those diagnosed 10 years earlier (1960-63).

New data from the SEER program of the National Cancer Institute gives survival data for cases diagnosed in 1973-80.

HOW CANCER WORKS

Normally, the cells that make up the body reproduce themselves in an orderly manner so that worn-out tissues are replaced, injuries are repaired and growth of the body proceeds.

Occasionally, certain cells undergo an abnormal change and begin a process of uncontrolled growth and spread: One cell divides into two, those redivide into four, and so on. These cells may grow into masses of tissue called tumors—some benign and others malignant (cancerous).

The danger of cancer is that it invades and destroys normal tissue. At the beginning, cancer cells usually remain at their original site, and the cancer is said to be localized. Later, some cancer cells may invade neighboring organs or tissue. This occurs either by direct extension of growth or by becoming detached and carried through the lymph or blood systems to other parts of the body. This is called metastasis of a cancer.

This spread may be regional—confined to one region of the body—when cells are trapped by lymph nodes. If left untreated, however, the cancer is likely to spread throughout the body. That condition is known as advanced cancer, and usually results in death.

Because with each stage a case of cancer becomes progressively more serious, it is important to detect cancer as early as possible. Aids to early detection include cancer's Seven Warning Signals and the cancer risk factors.

CANCER RATES IN BLACKS AND WHITES*

A study of cancer rates over several decades shows that the cancer incidence rate for blacks is higher than for whites, and that blacks also have a higher death rate than whites.

Male incidence and mortality rates in each race increased, while female rates decreased.

The overall cancer incidence rate for blacks went up 27%, while for whites it increased 12%. Cancer mortality has increased in both races, but the rate for blacks is greater than for whites. In the last 25 years, cancer death rates in whites have increased 9%, while black rates have increased 40%. The rates were virtually the same 25 years ago.

Cancer sites where blacks had significantly higher increases in incidence and mortality rates included the lung, colon-rectum, prostate and esophagus. Esophageal cancer, long considered mainly a disease of males, declined in whites and rose rapidly in blacks of both sexes.

The incidence of invasive cancer of the uterine cervix dropped in both black and white women, although the incidence in blacks is still more than double that in whites. However, the rate for endometrial cancer—or cancer of the body of the uterus—for white women is double that of black women.

Survival for patients diagnosed between 1967 and 1973 was compared. More whites than blacks had cancer diagnosed in an early, localized stage when the chances of cure are best: 37% versus 28% for males, and 42% versus 31% for females.

A recent ACS-sponsored survey by the black-owned New York firm of Evaxx, Inc. showed that urban black Americans tend to be much less knowledgeable than whites about cancer's warning signals, and less apt to see a doctor if they experience those symptoms. Specifically, the blacks interviewed knew little about three of the cancers that have seen a sharp increase in mortality: colorectal, prostate and esophageal. The survey also showed that blacks tend to underestimate both the prevalence of cancer and the chances of cure.

In both studies, most of the differences between whites and blacks were attributed to economic, environmental and social factors rather than to inherent biological characteristics. Because a higher percentage of blacks than whites are in the lower socio-economic group, risk of exposure to industrial carcinogens is increased. Also, limited educational opportunities may prevent early detection because the less educated are less likely to know the importance of symptoms which could lead to an early diagnosis.

TRENDS IN DIAGNOSIS AND TREATMENT

Cancer management today is becoming increasingly individualized both with respect to diagnostic procedures and treatment. Early detection is followed by a precise staging of the disease, and the use of more than one kind of therapy, often in combination.

The following 14 cancers a few decades ago had very poor prognoses—today they are being cured in many cases, predominantly because of chemotherapy advances: acute lymphocytic leukemia, adult myelogenous leukemia, Hodgkin's disease, histiocytic lymphoma, Burkitt's lymphoma, nodular mixed lymphoma, Ewing's sarcoma, Wilms' tumor, rhabdomyosarcoma, choriocarcinoma, testicular cancer, ovarian cancer, breast cancer, osteogenic sarcoma. Other cancers are being more effectively controlled than in the past.

An outstanding example of progress is the improvement in the management of Hodgkin's disease (a cancer of lymph glands predominantly in young adults). Better disease staging in certain cases, more precise application of new and improved x-ray therapy and/or a combination of four cancer drugs has resulted in remarkably improved survival. In less than 10 years, the five-year survival rate for early cases rose from 68% to 90%, and from 10% to 70% for advanced cancers of this type.

The following developments indicate the directions of current and future research:

- Thymosin, a biological response modifier (see Research section), is produced by the thymus gland, the master gland of the body's immune system. Recombinant DNA technology has helped to synthesize several of the important thymosin hormones. A partially purified thymosin preparation called thymosin fraction 5 has shown promise when used with chemotherapy. It can significantly prolong the survival of patients with oat cell carcinoma of the lung, as well as with head and neck tumors following radiation therapy.
- A genetic fusing of cancer cells can produce disease-fighting "monoclonal antibodies"—specific antibodies tailored to seek out chosen targets on cancer cells. There are already monoclonal antibodies which are effective against malarial parasites, various strains of flu virus and hepatitis B virus.
- Experiments have been conducted with simple, inexpensive blood tests, in which unique proteins, enzymes, antigens and other substances are used as indicators to determine whether an individual has cancer, and in some cases, where it is. These tests are known by such names as GT-II, CEA and B-protein. Good preliminary results have been obtained in selected cases by using the procedures to detect cancers of the breast, pancreas and other sites.

*Figures for cancer incidence are from the National Cancer Institute National Surveys, 1947, and the NCI SEER Program, 1973-1979; those for cancer mortality from the National Center for Health Statistics, 1953-1978.

- Intensive drug therapy before surgery has been successful in the treatment of children with certain bone tumors, and is being adapted to help fight some of the more common cancers in adults.
- A series of chemical injections near the spine can act as a nerve block, relieving certain cancer patients of debilitating pain.
- Retinoids, synthetic "cousins" of Vitamin A, have prevented bladder and breast cancers in mice and rats, and may also work against cancers of the lung, esophagus and pancreas in humans.
- About fifty drugs have been found effective against certain cancers, and others that are still being tested hold promise.
- Surgery now is more precise than in the past because of improved diagnostic equipment and laser instruments, and rehabilitation is improved through advances in plastic surgery.
- Common denominator approaches to cancer prevention may include the study and manipulation of "proto-oncogenes"—cancer-causing genes which are normal and essential for embryonic tissue development, and which normally become dormant. They may, however, be activated by radiation, chemicals and viruses later in life. Researchers have learned how to suppress oncogenes in some animals, and are determining whether the same can be done in humans.
- A new technique makes high and potentially lethal doses of the cancer drug, methotrexate, safe and effective for the treatment of some cancers.
- Many patients with bone cancer now are treated successfully by removing and replacing a section of bone rather than by amputating the leg or arm. Drugs and radiation therapy also are being used effectively following surgery, resulting in dramatic improvement in survival.
- High-frequency sound waves (ultrasound), instead of X rays, are being used to locate some tumors deep in the body. For patients undergoing radiation therapy, ultrasound may enable the therapist to pinpoint the tumor more precisely in order to provide more accurate radiation dosage and location of the tumor.
- Computerized tomography uses X rays to examine the brain and other parts of the body. Cross-section pictures are constructed which show a tumor's shape and location more accurately than is possible with conventional x-ray techniques.
- Immunotherapy holds hope of harnessing the body's own disease-fighting systems to combat cancer with essentially no major overt toxicity.
- Many cancers are caused by a two-stage process through exposure to two different kinds of substances known as initiators and promotors. Researchers are exploring ways of interrupting the process, thereby preventing the development of cancer.
- Because environmental factors have been found for virtually every major cancer, it is becoming possible to "profile" individuals according to their cancer risk factors, and therefore select the most appropriate time for detection tests.
- The tranfusion of blood components is becoming increasingly available and effective for cancer therapy. Platelets are used to prevent hemorrhaging, white cells to treat infection as well as the cancer itself. New technologies have made it possible to use bone marrow transplantations as a life-saving measure in certain selected patients.

TRENDS IN SURVIVAL BY SITE OF CANCER, BY RACE
Cases Diagnosed in 1960-63, in 1970-73 and in 1973-80

	WHITE			BLACK		
Site	1960-63[1] Relative 5-year Survival (%)	1970-73[1] Relative 5-year Survival (%)	1973-80[2] Relative 5-year Survival (%)	1960-63[1] Relative 5-year Survival (%)	1970-73[1] Relative 5-year Survival (%)	1973-80[2] Relative 5-year Survival (%)
Prostate	50	63	68	35	55	58
Kidney	37	46	50	38	44	52
Uterine Corpus	73	81	88	31	44	58
Bladder	53	61	73	24	36	48
Colon/Rectum	41	48	50	31	35	42
Uterine Cervix	58	64	68	47	61	62
Breast	63	68	74	46	51	62
Ovary	32	36	37	32	32	39
Brain and Central Nervous	18	20	21	19	19	23
Lung and Bronchus	8	10	12	5	7	10
Stomach	11	13	14	8	13	14
Esophagus	4	4	5	1	4	3
Hodgkin's Disease	40	67	70	*	*	70
Lymphocytic Leukemia-Acute	4	28	43	*	*	*
Leukemia	14	22	32	*	*	27
Non-Hodgkin's Lymphoma	31	41	46	*	*	46
Larynx	53	62	67	*	*	57
Melanoma of Skin	60	68	79	*	*	*
Testis	63	72	82	*	*	67
Thyroid	83	86	92	*	*	89

Source: Biometry Branch, National Cancer Institute

[1]Rates are based on data from a series of hospital registries and one population-based registry.

[2]Rates are from the SEER Program and include patients diagnosed through 1980 and follow-up on all patients through 1981. They are based on data from population-based registries in Connecticut, New Mexico, Utah, Iowa, Hawaii, Atlanta, Detroit, Seattle-Puget Sound, and San Francisco-Oakland.

*Rates could not be calculated because of insufficient number of cases.

ESTIMATED NEW CASES AND DEATHS FOR MAJOR SITES OF CANCER—1984*

SITE	NO. OF CASES	DEATHS
Lung	139,000	121,000
Colon-Rectum	130,000	59,000
Breast	116,000	38,000
Prostate	76,000	25,000
Uterus	55,000**	10,000
Urinary	57,000	19,000
Oral	27,000	9,000
Pancreas	25,000	23,000
Leukemia	24,000	17,000
Ovary	18,000	12,000
Skin	18,000***	7,000

*Figures rounded to nearest 1,000.
**If carcinoma in situ is included, cases total over 99,000.
***Estimated new cases of non-melanoma about 400,000.
INCIDENCE ESTIMATES ARE BASED ON RATES FROM N.C.I. SEER PROGRAM 1973-1979.

NEW CANCER CASES—1984

Estimated New Cancer Cases for All Sites Plus Major Sites, by State—1984

State	All Sites*	Major Sites								
	Number of Cases	Female Breast	Colon-Rectum	Lung	Oral	Uterus	Prostate	Stomach	Pancreas	Leukemia
Alabama	14,600	1,600	1,700	2,600	350	1,100	1,200	350	425	425
Alaska	600	50	50	125	15	30	25	20	10	20
Arizona	9,600	1,200	1,500	1,600	275	550	800	200	250	225
Arkansas	9,200	1,000	1,200	1,600	300	650	900	200	300	300
California	87,000	11,800	12,200	14,000	2,600	4,800	7,400	2,700	2,600	2,400
Colorado	7,800	1,000	1,200	1,100	175	400	550	200	250	250
Connecticut	13,200	2,200	2,000	1,900	450	800	1,200	400	400	400
Delaware	2,500	300	375	400	70	150	150	60	50	40
Dist. of Columbia	3,200	450	400	450	200	300	325	100	100	60
Florida	52,500	6,300	7,500	9,000	1,600	2,800	4,900	1,300	1,400	1,300
Georgia	17,500	1,900	2,100	3,200	600	1,200	1,700	400	450	500
Hawaii	2,400	325	325	375	100	125	150	200	60	70
Idaho	2,800	475	300	375	75	200	275	70	80	100
Illinois	44,000	6,000	6,800	7,000	1,500	2,700	3,600	1,400	1,300	1,200
Indiana	20,500	2,700	3,300	3,400	500	1,800	1,600	450	550	550
Iowa	11,300	1,500	2,400	1,700	300	800	1,200	300	350	400
Kansas	8,800	1,200	1,300	1,600	275	700	800	200	300	300
Kentucky	13,800	1,400	1,900	2,800	425	950	1,200	300	375	400
Louisiana	15,000	1,700	1,800	2,500	550	950	1,300	400	400	400
Maine	4,900	600	800	800	150	350	400	150	150	100
Maryland	17,000	2,500	2,500	2,700	650	1,100	1,500	400	400	400
Massachusetts	24,500	3,600	4,100	3,500	900	1,500	2,100	850	650	650
Michigan	32,500	4,300	4,700	5,200	950	2,200	3,000	900	850	900
Minnesota	14,200	2,000	2,300	1,900	375	800	1,600	500	450	475
Mississippi	9,100	850	1,100	1,600	250	600	1,100	275	300	300
Missouri	20,500	2,400	3,200	3,300	550	1,400	1,900	500	550	600
Montana	2,700	300	400	400	80	150	375	80	80	80
Nebraska	6,000	750	1,100	900	150	350	500	175	225	225
Nevada	2,700	325	325	500	60	150	150	20	60	40
New Hampshire	3,700	475	650	500	100	225	275	75	90	125
New Jersey	32,500	4,700	5,200	5,000	1,100	2,100	2,600	1,200	900	800
New Mexico	3,700	425	475	475	60	250	325	90	90	70
New York	74,500	11,600	12,600	10,800	2,600	4,800	6,100	2,800	2,400	2,000
North Carolina	21,000	2,700	2,800	3,300	650	1,400	2,100	425	600	500
North Dakota	2,500	375	425	275	50	125	300	100	80	70
Ohio	42,500	6,100	6,500	7,100	1,300	3,000	3,400	1,200	1,300	1,300
Oklahoma	11,800	1,300	1,700	2,100	375	650	1,000	300	325	325
Oregon	10,000	1,300	1,200	1,700	250	600	950	225	300	300
Pennsylvania	53,500	7,300	9,900	7,800	1,500	3,300	4,100	1,600	1,500	1,300
Rhode Island	4,800	650	900	700	200	300	400	200	150	80
South Carolina	9,900	1,200	1,200	1,600	350	800	1,000	200	300	250
South Dakota	2,600	425	450	400	50	150	300	80	90	100
Tennessee	17,500	1,900	2,300	3,100	550	1,100	1,500	350	500	475
Texas	44,500	5,400	5,600	7,600	1,500	2,700	3,800	1,300	1,200	1,400
Utah	3,100	475	425	275	60	225	300	80	80	80
Vermont	2,100	250	300	350	60	150	200	50	50	60
Virginia	17,500	2,300	2,300	3,100	550	1,100	1,500	425	475	425
Washington	14,700	2,000	2,100	2,400	450	800	1,400	375	425	450
West Virginia	7,900	850	1,000	1,300	200	600	650	200	250	200
Wisconsin	18,000	2,400	2,900	2,400	530	950	1,800	600	500	550
Wyoming	1,300	150	200	200	20	70	100	25	30	30
United States	870,000	115,000	130,000	139,000	27,000	55,000	76,000	25,000	25,000	24,000
Puerto Rico	6,000	450	450	350	425	750	400	500	100	175

*Does not include carcinoma in situ or non-melanoma skin cancer.

These estimates are offered as a rough guide and should not be regarded as definitive. They are calculated according to the distribution of estimated 1984 cancer deaths by state. Especially note that year-to-year changes may only represent improvements in the basic data.

CANCER DEATHS—1984

Estimated Cancer Deaths for All Sites Plus Major Sites, by State—1984

State	All Sites		Major Sites								
	Number of Deaths	Death Rate per 100,000 Population	Female Breast	Colon-Rectum	Lung	Oral	Uterus	Prostate	Stomach	Pancreas	Leukemia
Alabama	7,600	191	500	800	2,400	125	200	425	200	375	300
Alaska	300	68	20	30	100	5	10	10	10	10	10
Arizona	5,200	174	325	600	1,500	100	50	250	125	225	175
Arkansas	4,800	210	325	550	1,600	100	100	300	150	275	225
California	45,000	176	3,700	5,600	12,300	850	900	2,400	1,500	2,400	1,700
Colorado	4,000	127	325	550	1,000	70	70	250	125	225	175
Connecticut	6,800	213	650	900	1,600	175	125	350	250	350	275
Delaware	1,300	215	80	200	325	25	20	60	30	60	40
Dist. of Columbia	1,600	261	175	200	375	75	60	100	60	100	40
Florida	27,300	244	1,900	3,400	7,800	450	400	1,600	800	1,400	850
Georgia	9,300	159	650	950	2,900	200	250	500	225	425	350
Hawaii	1,300	128	75	150	300	30	20	50	90	60	50
Idaho	1,500	151	100	150	300	25	25	90	40	70	70
Illinois	22,800	197	2,000	3,200	5,900	500	600	1,200	750	1,200	900
Indiana	10,700	198	900	1,500	3,000	200	300	550	250	500	425
Iowa	5,800	203	500	1,000	1,600	100	125	400	150	325	300
Kansas	4,700	193	425	600	1,500	100	100	300	125	250	200
Kentucky	7,200	197	475	900	2,400	175	175	400	150	375	275
Louisiana	7,800	170	550	800	2,300	175	175	450	250	400	300
Maine	2,500	217	200	350	650	50	60	150	90	125	80
Maryland	8,800	201	700	1,200	2,500	200	175	450	225	400	275
Massachusetts	12,700	217	1,200	1,900	3,200	325	275	650	500	650	450
Michigan	16,600	182	1,400	2,100	4,400	325	400	950	475	800	650
Minnesota	7,400	179	650	1,000	1,800	150	125	500	250	425	350
Mississippi	4,700	184	300	500	1,400	90	100	350	125	275	200
Missouri	10,600	212	800	1,400	2,800	200	250	600	275	475	400
Montana	1,400	173	100	175	350	30	30	125	50	80	60
Nebraska	3,300	207	275	500	800	60	70	225	125	175	175
Nevada	1,400	144	80	150	400	25	20	50	10	60	30
New Hampshire	2,000	205	150	300	425	40	40	90	40	80	70
New Jersey	16,800	224	1,600	2,400	4,300	350	375	850	650	800	550
New Mexico	1,900	136	125	200	375	25	40	90	50	100	60
New York	38,000	215	4,000	5,800	9,200	850	950	1,900	1,600	2,100	1,400
North Carolina	10,800	176	750	1,200	2,800	225	275	650	250	475	400
North Dakota	1,200	179	90	175	225	20	20	90	60	80	50
Ohio	21,900	204	1,900	3,100	5,800	425	600	1,200	650	1,100	800
Oklahoma	6,100	185	400	800	1,800	100	100	350	150	300	250
Oregon	5,200	193	375	550	1,600	100	75	325	125	275	200
Pennsylvania	27,500	232	2,400	4,300	6,600	500	700	1,400	850	1,400	950
Rhode Island	2,500	259	250	400	600	60	40	150	100	100	70
South Carolina	5,100	155	375	550	1,500	100	125	325	125	275	175
South Dakota	1,400	208	100	200	300	20	30	100	50	100	80
Tennessee	8,800	189	600	950	2,600	200	200	475	225	450	325
Texas	22,900	141	1,700	2,500	6,400	425	500	1,300	700	1,200	1,000
Utah	1,600	96	150	175	225	20	30	100	50	75	70
Vermont	1,100	208	80	150	275	20	30	70	30	50	40
Virginia	9,100	160	750	1,100	2,800	175	225	500	250	425	325
Washington	7,700	174	600	950	2,200	150	150	425	200	400	300
West Virginia	4,100	209	275	475	1,200	75	100	225	100	200	150
Wisconsin	9,200	192	900	1,300	2,100	175	175	600	325	475	375
Wyoming	700	128	50	70	175	10	10	50	15	50	30
United States	450,000	191	37,000	59,000	121,000	9,000	10,000	25,000	14,000	23,000	17,000
Puerto Rico	3,000	94	125	125	300	175	150	225	400	100	150

ESTIMATED NEW CANCER CASES AND DEATHS BY SEX FOR ALL SITES—1984*

Site	Estimated New Cases			Estimated Deaths		
	Total	Male	Female	Total	Male	Female
All Sites	870,000*	429,000*	441,000*	450,000	244,500	205,500
Buccal Cavity & Pharynx (**Oral**)	27,500	18,700	8,800	9,350	6,400	2,950
Lip	4,900	4,200	700	175	150	25
Tongue	4,900	3,200	1,700	2,050	1,400	650
Salivary Gland				700	450	250
Floor of Mouth	9,800	5,800	4,000	525	400	125
Other & Unspecified Mouth				1,600	1,000	600
Pharynx	7,900	5,500	2,400	4,300	3,000	1,300
Digestive Organs	207,000	105,100	101,900	117,300	61,450	55,850
Esophagus	9,100	6,500	2,600	8,600	6,300	2,300
Stomach	24,900	15,000	9,900	14,100	8,300	5,800
Small Intestine	2,100	1,100	1,000	700	350	350
Large Intestine (**Colon-Rectum**)	90,000	41,000	49,000	50,900	24,200	26,700
Rectum	40,000	21,000	19,000	8,500	4,600	3,900
Liver & Biliary Passages	13,300	6,300	7,000	10,100	5,000	5,100
Pancreas	25,100	13,000	12,100	23,000	12,000	11,000
Other & Unspecified Digestive	2,500	1,200	1,300	1,400	700	700
Respiratory System	153,400	107,500	45,900	126,150	89,000	37,150
Larynx	11,100	9,300	1,800	3,750	3,100	650
Lung	139,000	96,000	43,000	121,000	85,000	36,000
Other & Unspecified Respiratory	3,300	2,200	1,100	1,400	900	500
Bone, Tissue and Skin	24,500	12,500	12,000	11,150	6,400	4,750
Bone	1,900	1,100	800	1,350	800	550
Connective Tissue	4,900	2,700	2,200	2,400	1,200	1,200
Skin	17,700**	8,700**	9,000**	7,400†	4,400	3,000
Breast	115,900***	900***	115,000***	37,600	300	37,300
Genital Organs	159,300	81,600	77,700	48,150	25,950	22,200
Cervix Uteri (**Uterus**)	16,000***	—	16,000***	6,800	—	6,800
Corpus, Endometrium (**Uterus**)	39,000	—	39,000	2,900	—	2,900
Ovary	18,300	—	18,300	11,500	—	11,500
Prostate	76,000	76,000	—	25,000	25,000	—
Other & Unspecified Genital, Male	5,600	5,600	—	950	950	—
Other & Unspecified Genital, Female	4,400	—	4,400	1,000	—	1,000
Urinary Organs	57,100	39,600	17,500	19,400	12,600	6,800
Bladder	38,700	28,000	10,700	10,700	7,300	3,400
Kidney & Other Urinary	18,400	11,600	6,800	8,700	5,300	3,400
Eye	1,900	1,000	900	400	200	200
Brain & Central Nervous System	12,800	7,100	5,700	10,400	5,700	4,700
Endocrine Glands	11,400	3,500	7,900	1,600	700	900
Thyroid	10,300	2,900	7,400	1,100	400	700
Other Endocrine	1,100	600	500	500	300	200
Leukemia	24,400	13,200	11,200	16,700	9,300	7,400
Other Blood & Lymph Tissues	40,600	21,100	19,500	21,600	11,300	10,300
Hodgkin's Disease	7,100	4,100	3,000	1,500	900	600
Multiple Myeloma	9,800	5,000	4,800	7,200	3,700	3,500
Other Lymphomas	23,700	12,000	11,700	12,900	6,700	6,200
All Other & Unspecified Sites	34,200	17,200	17,000	30,200	15,200	15,000

NOTE: The estimates of new cancer cases are offered as a rough guide and should not be regarded as definitive. Especially note that year-to-year changes may only represent improvements in the basic data. ACS six major sites in boldface.

*Carcinoma in situ and non-melanoma skin cancers not included in totals. Carcinoma in situ of the uterine cervix accounts for over 45,000 new cases annually and carcinoma in situ of the female breast accounts for over 5,000 new cases annually. Non-melanoma skin cancer accounts for about 400,000 new cases annually.

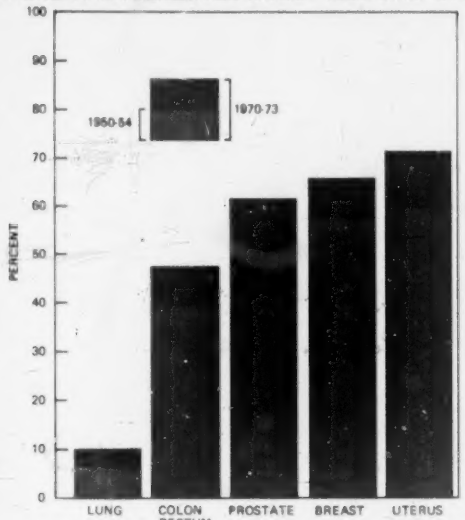
**Melanoma only.

***Invasive cancer only.

†Melanoma 5,500; other skin 1,900.

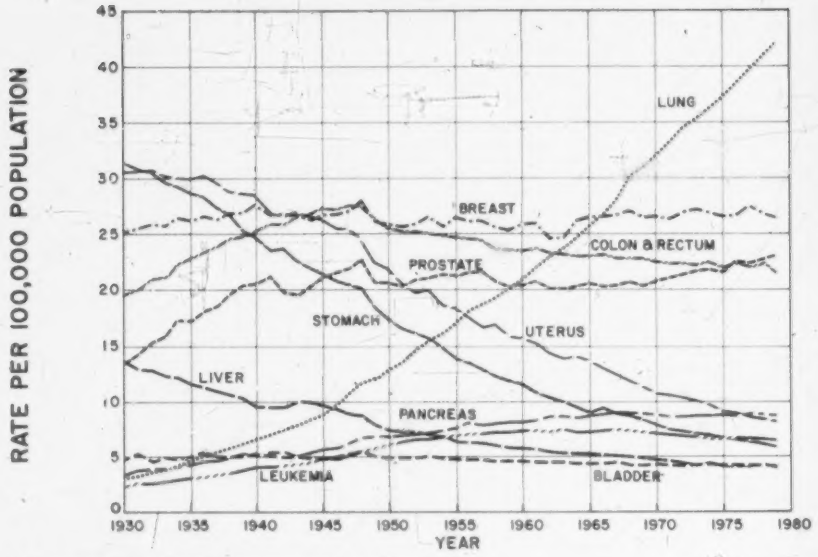
INCIDENCE ESTIMATES ARE BASED ON RATES FROM NCI SEER PROGRAM 1973-1979.

FIVE YEAR CANCER SURVIVAL RATES*
TRENDS FOR SELECTED SITES – 1950-54 to 1970-73



*Adjusted for normal life expectancy.
Source: Biometry Branch, National Cancer Institute

CANCER DEATH RATES* BY SITE
UNITED STATES, 1930–1979



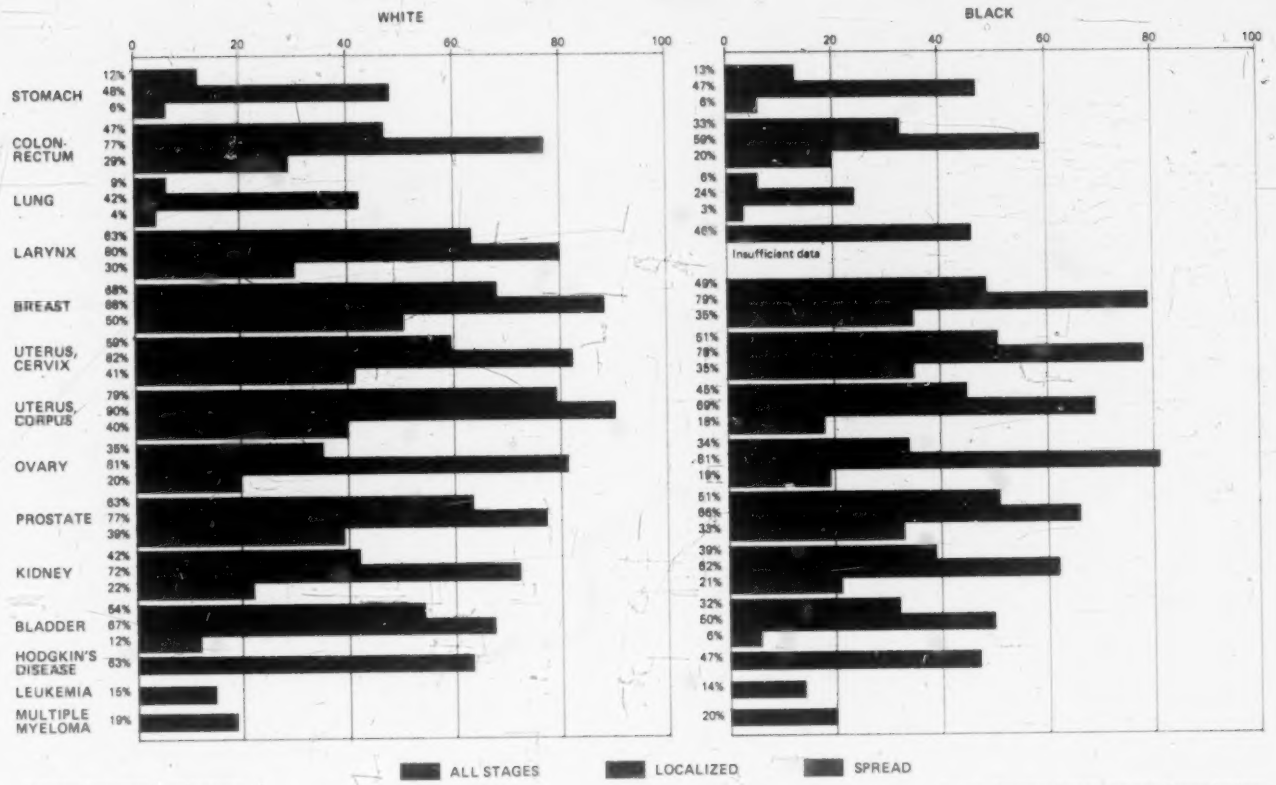
*Rate for the population standardized for age on the 1970 U.S. population
Sources of Data: National Center for Health Statistics and Bureau of the Census, United States.
Note: Rates are for both sexes combined except breast and uterus female population only and prostate male population only.

25-Year Trends in Age-Adjusted Cancer Death Rates Per 100,000 Population 1952-54 to 1977-79

Sex	Sites	1952-54	1977-79	Percent Changes	Comments
Male	All Sites	174.3	216.7	+ 24	Steady increase mainly due to lung cancer.
Female	All Sites	146.5	136.1	– 7	Slight decrease.
Male	Bladder	7.2	7.1	*	Slight fluctuations; overall no change.
Female	Bladder	3.1	2.1	– 32	Some fluctuations; noticeable decrease.
Male	Breast	0.3	0.3	*	Constant rate.
Female	Breast	26.0	27.0	+ 4	Slight fluctuations; overall no change.
Male	Colon & Rectum	25.9	26.2	*	Slight fluctuations; overall no change.
Female	Colon & Rectum	24.6	19.6	– 20	Slight fluctuations; noticeable decrease.
Male	Esophagus	4.7	5.4	+ 15	Some fluctuations; slight increase.
Female	Esophagus	1.2	1.6	*	Slight fluctuations; overall no change.
Male	Kidney	3.5	4.7	+ 34	Steady slight increase.
Female	Kidney	2.1	2.2	*	Slight fluctuations; overall no change.
Male	Leukemia	8.0	8.7	+ 9	Early increase, later leveling off.
Female	Leukemia	5.5	5.2	– 6	Slight early increase, later leveling off and decrease.
Male	Liver	6.3	4.8	– 24	Some fluctuations. Steady decrease in both
Female	Liver	7.4	3.6	– 51	sexes.
Male	Lung	26.6	71.0	+ 167	Steady increase in both sexes due to cigarette
Female	Lung	5.0	18.8	+ 276	smoking.
Male	Oral	5.9	5.8	*	Slight fluctuations; overall no change in both
Female	Oral	1.5	2.0	*	sexes.
Female	Ovary	8.3	8.4	+ 1	Steady increase, later leveling off.
Male	Pancreas	8.8	11.0	+ 25	Steady increase in both sexes, then leveling off.
Female	Pancreas	5.7	7.1	+ 25	Reasons unknown.
Male	Prostate	21.5	23.7	+ 10	Fluctuations all through period; overall slight increase.
Male	Skin	3.1	3.5	*	Slight fluctuations; overall no change in both
Female	Skin	1.9	1.9	*	sexes.
Male	Stomach	22.1	9.1	– 59	Steady decrease in both sexes; reasons unknown.
Female	Stomach	11.7	4.1	– 65	
Female	Uterus	19.5	8.3	– 57	Steady decrease.

*Percent changes not listed because they are not meaningful.

FIVE-YEAR CANCER SURVIVAL RATES* FOR SELECTED SITES BY RACE

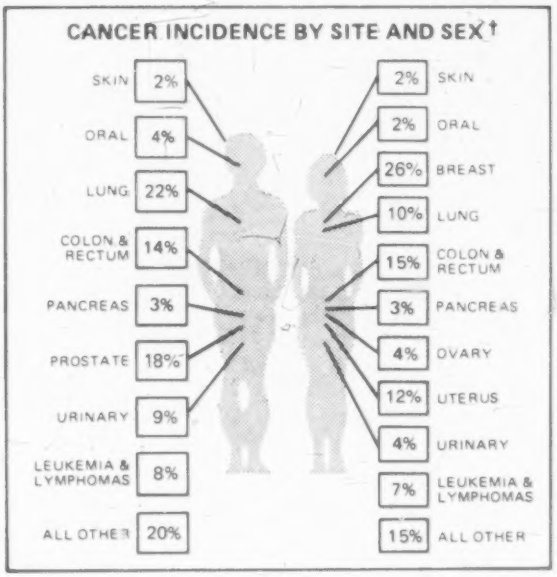


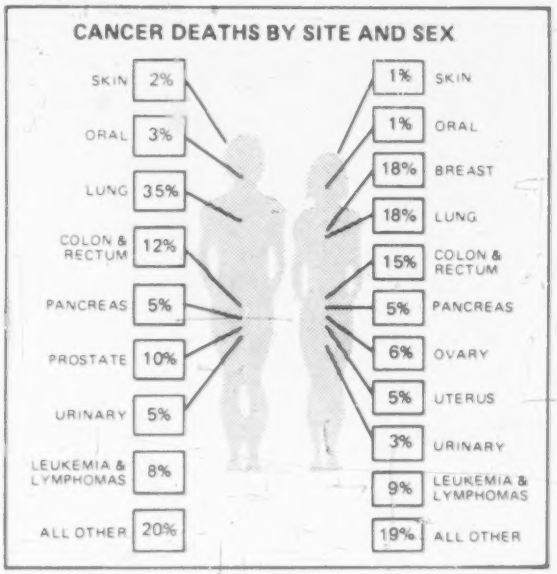
*Adjusted for normal life expectancy

Note: This chart is based on cases diagnosed in 1964-73, and is the latest data available on survival by stage.

Source: Biometry Branch, National Cancer Institute

1984 ESTIMATES





†Excluding non-melanoma skin cancer and carcinoma in situ.

CANCER AROUND THE WORLD, 1978-1979

Age-adjusted Death Rates Per 100,000 Population for Selected Sites for 48 Countries

Country	All Sites		Oral		Colon & Rectum		Lung		Breast	Uterus	Stomach		Prostate	Leukemia	
	Male	Female	Male	Female	Male	Female	Male	Female	Female	Female	Male	Female	Male	Male	Female
United States*	216.9(18)	137.7(19)	5.8(14)	1.9(7)	26.5(15)	20.2(15)	70.3(9)	19.0(5)	27.1(14)	8.4(37)	8.6(43)	4.3(44)	22.9(13)	8.7(7)	5.2(6)
Argentina*	215.9(19)	139.3(17)	4.5(22)	0.8(38)	20.5(24)	17.5(21)	54.9(22)	9.5(16)	24.7(16)	14.7(12)	23.5(26)	11.6(26)	18.9(24)	6.0(28)	4.4(24)
Australia	212.4(21)	125.4(29)	5.4(18)	1.7(10)	28.4(11)	21.8(10)	62.0(18)	11.5(14)	23.2(20)	7.5(39)	14.9(39)	7.2(40)	22.2(16)	7.7(17)	4.6(21)
Austria	247.3(9)	147.6(12)	5.5(17)	0.8(38)	32.8(3)	21.6(12)	66.8(12)	9.3(17)	23.2(20)	14.2(14)	36.8(8)	18.5(10)	22.5(15)	7.3(21)	4.8(17)
Barbados**	179.0(30)	136.1(21)	9.1(7)	1.4(19)	5.3(41)	14.4(27)	12.6(41)	5.8(34)	27.4(12)	30.0(1)	33.7(11)	12.4(23)	41.0(1)	8.9(3)	1.4(45)
Bulgaria	156.3(38)	102.6(37)	2.5(38)	0.9(34)	14.4(31)	11.1(33)	43.6(26)	7.4(25)	15.8(30)	9.4(30)	33.4(12)	20.5(7)	9.0(38)	5.2(35)	4.0(31)
Canada*	214.9(20)	136.3(20)	6.0(13)	1.7(10)	29.7(9)	23.1(8)	65.5(13)	14.2(11)	27.8(11)	8.5(35)	14.4(40)	6.7(42)	21.9(18)	8.4(8)	5.1(10)
Chile	191.3(26)	148.5(10)	3.5(30)	0.7(43)	9.6(35)	9.9(36)	24.9(36)	6.8(30)	14.1(35)	21.3(5)	61.8(3)	28.3(3)	16.5(29)	4.4(38)	4.0(31)
Costa Rica	178.6(31)	138.3(18)	3.4(31)	1.1(27)	7.7(37)	8.5(38)	15.6(40)	7.1(27)	9.9(38)	18.5(7)	62.1(2)	33.5(1)	14.8(31)	7.1(22)	6.3(1)
Cuba*	172.1(34)	119.1(31)	9.2(6)	2.2(6)	13.4(32)	15.1(25)	50.1(24)	16.6(8)	17.9(25)	17.6(9)	13.1(41)	7.1(41)	23.3(11)	5.7(30)	4.1(30)
Denmark	233.3(13)	172.3(1)	4.0(26)	1.9(7)	34.0(1)	26.1(2)	68.6(11)	17.2(7)	30.6(6)	14.4(13)	18.5(34)	10.2(31)	23.2(12)	9.0(2)	5.7(2)
Dominican Rep.*	53.7(45)	48.1(45)	1.9(43)	1.6(16)	4.3(43)	3.7(42)	5.6(44)	3.0(44)	4.1(44)	8.8(34)	4.3(44)	2.2(45)	8.6(39)	2.1(44)	1.5(44)
Ecuador*	87.3(42)	86.9(40)	1.2(46)	0.6(45)	3.1(44)	3.9(41)	5.9(43)	2.3(45)	6.0(42)	23.0(4)	31.8(14)	20.5(7)	10.5(37)	2.9(41)	2.5(41)
Egypt*	39.0(47)	18.8(48)	0.6(47)	0.2(47)	2.1(45)	1.1(47)	2.5(47)	1.1(47)	3.4(45)	2.0(47)	1.9(46)	1.1(46)	1.5(46)	2.3(43)	1.4(45)
England & Wales	248.7(8)	156.9(5)	3.6(29)	1.7(10)	28.4(11)	21.7(11)	95.7(3)	20.7(4)	33.8(1)	10.2(26)	24.0(25)	11.4(27)	18.3(25)	7.0(23)	4.5(22)
Fiji*	54.0(44)	79.8(41)	1.8(44)	3.4(3)	4.7(42)	3.0(43)	4.0(45)	5.7(35)	7.9(40)	28.5(2)	9.5(42)	4.9(43)	3.3(45)	2.4(42)	5.2(6)
Finland*	243.9(10)	113.9(32)	3.7(28)	1.4(19)	15.7(27)	13.3(28)	86.5(5)	6.5(31)	17.6(26)	8.1(38)	30.7(16)	15.0(18)	24.0(8)	8.8(5)	4.3(25)
France*	255.7(6)	120.8(30)	18.3(2)	1.4(19)	27.5(13)	18.1(20)	51.8(23)	4.9(41)	21.9(24)	10.7(25)	18.0(35)	8.6(37)	22.0(17)	8.9(3)	5.3(3)
Germany, F.R.	242.0(11)	152.0(8)	4.1(24)	0.9(34)	31.3(5)	23.9(7)	36.0(29)	7.2(26)	25.3(15)	11.5(19)	30.6(17)	16.3(12)	23.9(9)	7.8(15)	5.2(6)
Greece	188.3(28)	103.6(36)	2.2(40)	0.8(38)	8.3(36)	7.7(40)	58.5(21)	8.8(18)	16.2(29)	7.3(41)	17.3(36)	9.8(33)	11.0(36)	8.4(8)	4.7(20)
Guatemala*	68.6(43)	78.8(42)	2.2(40)	1.0(30)	2.0(46)	2.5(44)	2.7(46)	2.0(46)	2.7(46)	12.6(16)	21.6(29)	18.9(9)	4.9(41)	1.5(47)	1.1(47)
Hong Kong	235.2(12)	125.5(28)	20.3(1)	7.2(1)	19.2(25)	12.8(29)	68.9(10)	30.9(1)	10.7(37)	8.5(35)	19.6(32)	9.1(36)	3.7(44)	5.5(31)	3.9(34)
Hungary	269.3(3)	162.6(3)	8.2(8)	1.6(16)	30.5(7)	23.0(9)	72.5(7)	12.1(13)	24.6(17)	18.3(8)	44.6(4)	20.9(4)	24.2(7)	7.7(17)	5.2(6)
Iceland	150.7(39)	140.7(16)	2.0(42)	2.6(4)	16.2(26)	15.1(25)	28.3(34)	16.5(9)	27.2(13)	6.6(44)	26.3(21)	12.9(22)	14.0(33)	9.6(1)	3.7(36)
Ireland*	219.0(17)	158.8(4)	5.7(16)	1.7(10)	32.0(4)	26.0(3)	60.5(20)	17.8(6)	32.1(4)	7.3(41)	21.7(27)	14.4(19)	23.9(9)	6.3(25)	4.5(22)
Israel	174.7(32)	145.9(13)	1.7(45)	0.9(34)	22.7(22)	18.2(17)	32.9(31)	10.5(15)	28.3(10)	6.5(45)	15.9(38)	9.8(33)	13.1(34)	8.8(5)	4.8(17)
Italy	228.5(15)	126.0(27)	7.3(11)	1.1(27)	23.5(21)	17.5(21)	61.8(19)	7.1(27)	22.3(23)	11.4(21)	31.3(15)	15.7(15)	15.8(30)	8.0(12)	5.1(10)
Japan	190.0(27)	109.3(33)	2.4(39)	0.8(38)	15.5(29)	11.4(32)	31.2(33)	8.8(18)	6.0(42)	9.3(31)	66.1(1)	31.2(2)	3.9(42)	4.8(37)	3.2(39)
Luxembourg	269.0(4)	148.3(11)	9.7(5)	0.3(46)	31.3(5)	26.4(4)	87.5(4)	8.6(20)	24.4(18)	13.0(15)	26.9(20)	12.1(25)	20.7(20)	7.9(14)	5.3(3)
Mauritius	100.0(41)	71.6(44)	4.1(24)	0.7(43)	5.7(40)	2.5(44)	21.2(37)	5.2(39)	5.6(41)	10.5(23)	21.4(30)	9.6(35)	5.4(40)	1.9(45)	1.8(42)
Netherlands	266.2(5)	144.8(14)	2.6(36)	1.0(30)	26.4(16)	21.3(14)	101.2(2)	6.8(30)	31.9(5)	9.0(33)	25.5(22)	11.3(29)	24.3(6)	8.2(10)	5.3(3)
New Zealand	172.0(35)	154.4(7)	4.9(19)	1.7(10)	33.3(2)	29.5(1)	64.4(14)	16.1(10)	30.0(7)	9.8(28)	16.9(37)	7.5(39)	22.7(14)	7.6(19)	5.0(13)
Nicaragua*	22.9(48)	35.9(46)	0.0(48)	0.0(48)	0.1(48)	0.5(48)	1.4(48)	0.0(48)	0.0(48)	0.4(48)	0.1(47)	0.5(48)	0.0(48)	1.6(46)	1.8(42)
Northern Ireland*	226.0(16)	151.7(9)	3.3(33)	1.8(9)	28.5(10)	24.1(6)	74.0(6)	14.2(11)	32.5(3)	7.5(39)	24.8(23)	14.1(20)	19.3(23)	8.1(11)	4.9(15)
Norway	193.8(25)	130.4(23)	3.1(34)	1.1(27)	24.0(19)	19.7(16)	31.7(32)	6.3(33)	23.6(19)	10.2(26)	21.1(31)	10.6(30)	31.1(3)	7.8(15)	4.9(15)
Poland	214.2(22)	126.2(26)	5.8(14)	1.3(23)	15.2(30)	11.7(31)	63.6(16)	7.9(23)	16.6(28)	15.0(11)	41.0(5)	16.2(14)	12.2(35)	6.6(24)	4.2(28)
Portugal	180.1(29)	108.0(34)	6.6(12)	1.3(23)	22.4(23)	17.3(24)	25.4(35)	4.2(42)	17.6(26)	12.3(17)	40.6(6)	20.9(4)	21.8(19)	6.3(25)	4.3(25)
Puerto Rico**	157.3(37)	95.1(39)	10.0(4)	1.6(16)	6.4(39)	7.9(39)	19.2(39)	5.6(37)	9.2(39)	7.3(41)	NA	8.5(38)	17.6(26)	5.1(36)	4.3(25)
Romania*	161.7(36)	106.0(35)	3.8(27)	1.0(30)	10.2(34)	9.0(37)	38.3(28)	7.0(29)	14.2(34)	18.7(6)	35.4(9)	15.7(15)	20.2(21)	5.3(33)	3.4(38)
Scotland	275.0(1)	172.0(2)	4.2(23)	1.7(10)	30.4(8)	24.6(4)	113.2(1)	27.5(2)	33.2(2)	9.8(28)	24.5(24)	12.3(24)	17.4(27)	6.3(25)	4.2(28)
Singapore	249.6(7)	130.4(23)	16.9(3)	5.8(2)	23.9(20)	18.2(17)	71.9(8)	21.2(3)	15.5(32)	11.3(22)	39.6(7)	16.3(12)	3.9(42)	4.4(38)	4.0(31)
Spain*	194.9(24)	75.1(43)	4.6(21)	0.8(38)	15.7(27)	12.8(29)	41.2(27)	5.0(40)	15.8(30)	9.5(29)	28.7(18)	15.4(17)	19.4(22)	5.4(32)	3.9(34)
Sweden	198.0(23)	141.2(15)	3.4(31)	1.4(19)	24.2(18)	18.2(17)	34.3(30)	8.5(21)	22.9(22)	9.1(32)	19.1(33)	10.0(32)	31.8(2)	8.0(12)	5.1(10)
Switzerland	230.3(14)	134.2(22)	7.6(9)	1.3(23)	25.8(17)	17.5(21)	62.6(17)	5.8(34)	29.5(8)	10.8(24)	21.7(27)	11.4(27)	27.7(4)	7.4(20)	4.8(17)
Thailand	46.2(46)	30.4(47)	2.6(36)	1.3(23)	1.9(47)	1.2(46)	6.5(42)	4.2(42)	1.2(47)	4.2(46)	2.1(45)	0.8(47)	0.2(47)	0.7(48)	0.5(48)
Uruguay*	271.8(2)	156.2(6)	7.6(9)	1.0(30)	27.0(14)	21.4(13)	63.9(15)	5.5(38)	29.2(9)	15.2(10)	32.6(13)	16.8(11)	27.6(5)	5.8(29)	5.0(13)
Venezuela*	135.0(40)	128.9(25)	3.1(34)	2.6(4)	7.1(38)	10.1(35)	20.4(38)	8.3(22)	11.5(36)	27.7(3)	34.0(10)	20.7(6)	16.8(28)	5.3(33)	3.6(37)
Yugoslavia*	172.7(33)	102.4(38)	4.8(20)	0.9(34)	13.1(33)	10.2(34)	44.3(25)	7.6(24)	14.5(33)	11.8(18)	27.9(19)	13.8(21)	14.7(32)	3.9(40)	2.8(40)

NOTE: Figures in parentheses are order of rank within site and sex group. *1978 only. **1979 only. NA-Not available Source of Data: World Health Statistics Annual 1980-1982

LUNG CANCER

Incidence: An estimated 130,000 new cases in 1984.

Mortality: An estimated 121,000 deaths in 1984. The age-standardized lung cancer death rate for women is now approaching that of colorectal cancer, and within the next few years may surpass breast cancer to become the number one cancer killer of women. Those who smoke two or more packs of cigarettes a day have lung cancer mortality rates 15 to 25 times greater than nonsmokers, says the 1982 Surgeon General's Report.

Warning Signals: A persistent cough; sputum streaked with blood; chest pain; recurring attacks of pneumonia or bronchitis.

Risk Factors: Heavy cigarette smoking; history of smoking 20 or more years; exposure to certain industrial substances such as asbestos, particularly for those who smoke.

Early Detection: Lung cancer is very difficult to detect early. If a smoker quits at the time of early cellular changes, the damaged bronchial lining often returns to normal. Continued smoking in many cases causes the cells to form abnormal growth patterns that lead to cancer. Diagnosis may be aided by such procedures as the chest X ray, sputum cytology test and fiberoptic bronchoscopy.

Treatment: Surgery, radiation therapy and chemotherapy. For localized cancers, surgery is usually the treatment of choice, and with improved ventilation machinery and better antibiotics, surgical complications are infrequent. Since a third of all surgical lung cancer patients experience tumor spread, radiation therapy and chemotherapy are frequently used as well as surgery.

Survival: Only 9% of lung cancer patients (all stages, whites and blacks) live five or more years after diagnosis. The rate is 39% for cases detected in a localized stage; 20% of lung cancers are discovered that early. Rates have improved only slightly over a recent 10-year period. Since lung cancer in women grows more slowly than that in men, women with the disease generally live longer than men.

SMOKING

The American Cancer Society estimates that cigarette smoking is responsible for 83% of lung cancer cases among men and 43% among women—more than 75% overall.

The cancer death rate for male smokers is double that of nonsmokers, and the rate for female smokers is 30% higher than for nonsmokers.

The higher cancer rates for men reflect the fact that in the past, more men than women smoked, and smoked more heavily. In recent years, however, the gap between male and female smoking has been narrowing.

Smoking also has been implicated in cancers of the mouth, pharynx, larynx, esophagus, pancreas and bladder. Smoking accounts for about 30% of all cancers, is a major cause of heart disease, and is linked to conditions ranging from colds and gastric ulcers to chronic bronchitis and emphysema.

Smoking-related disorders are estimated to cause about 350,000 premature deaths each year, and cost the nation about $27 billion in medical care.

A DECLINE IN SMOKING

In recent years, the proportion of adult smokers in the U.S. population has been declining. A June 1983 tobacco report of the U.S. Department of Agriculture estimates cigarette output* in 1982-83 at 670 billion, down about 7 % from last year.

Consumption during the same period dropped about 3 %, which the report attributes to "higher prices largely resulting from increased Federal and State excise taxes." The Federal excise tax on cigarettes was raised by 8 cents a pack in January 1983, and preliminary figures for the first six months of that year indicate there may be another 3% drop in cigarette consumption in 1983.

From 1976 to 1980, adult male smokers (17 years and older) dropped from 41.9% of the population to 36.7%, while women smokers decreased from 32% to 28.9%, according to the U.S. Office on Smoking and Health. Overall, the percentage of men and women smokers in the population had dropped to 32.6%.

Per capita cigarette consumption among adults has fallen—from 4,043 in 1972 to 3,746 in 1982—reflecting a growing number of ex-smokers. From 1965 to 1980, the proportion of adult male ex-smokers (20 years and older) in the total U.S. population increased from 20.5% to 29.2%, while female ex-smokers rose from 8.2% to 15.5%.

Among teenagers, smokers aged 12 to 18 years declined 25% between 1974 and 1979, according to a Government study. A more recent survey supported by the National Institute on Drug Abuse indicated that the percentage of high school seniors (aged 17 and 18) who smoked at least half a pack of cigarettes decreased by about a quarter, from 19.4% in 1979 to 14.5% in 1982.

It is now estimated—from past national surveys and data from the Cancer Prevention Study II—that there are more than 33 million ex-cigarette smokers in the United States today.

At the same time, however, the average smoker ap-

*The number of cigarettes released by manufacturers into the market; not necessarily the same as production or consumption.

pears to be smoking more heavily. The U.S. Office on Smoking and Health reports that the proportion of adult male smokers (20 years and older) consuming 25 or more cigarettes per day increased from 31% to 34% between 1976 and 1980, and female smokers from 19.6% to 23.7%.

WAYS OF QUITTING

A Federal Trade Commission staff report states that although most Americans are aware of a health risk in smoking, more than 40% don't know smoking causes most lung cancer, and 20% don't know it can cause cancer at all. More than 30% are unaware that smoking doubles a person's risk of heart attack, and 50% of women do not know that smoking during pregnancy increases the risk of stillbirth and miscarriage.

The report prompted the Society to launch an accelerated educational effort to help smokers understand how dangerous smoking is and how specific smoking-related health risks apply to them personally.

Comprehensive Approach The Society recommends a comprehensive approach to smoking control at the local level:

(1) encouraging young people not to start smoking; (2) educating the public on the hazards of smoking with the aim of getting smokers to quit on their own; (3) assisting smokers in stopping on their own by providing self-help materials, such as the *Quitter's Guide* and the *I Quit Kit*, as well as by working with the media; (4) recruiting ex-smoker volunteers to provide one-to-one help for smokers now trying to quit; (5) first encouraging and preparing industries, hospitals and organizations to conduct smoking cessation programs on their own, and then making available the new, cost-effective ACS quit-smoking group program, FRESHSTART, and (6) supporting legislation to restrict smoking in public places.

LOWER TAR & NICOTINE

Research has shown that there is no such thing as a "safe" cigarette, but that those who are not yet able to quit would be well advised to switch to brands with the lowest possible tar and nicotine (T/N) content. Moreover, low T/N smokers find it easier to quit altogether than high T/N smokers.

From 1960 to 1972, the average mortality of low T/N smokers was 16% lower than that of high T/N smokers, and the comparable figure for lung cancer mortality was 26%.

Besides tar and nicotine, cigarette smoke contains poisonous gases—hydrogen cyanide, volatile aromatic hydrocarbons, and especially carbon monoxide—which is a possible critical factor in coronary heart disease and fetal growth retardation, among other things. Despite some reduced hazards due to the growing number of filtered cigarettes, certain brands have been found to deliver more carbon monoxide than those without filters

PASSIVE SMOKING HAZARDS

There may even be hazards for nonsmokers who breathe the smoke of others' cigarettes. Two scientific studies recently indicated an increased risk of lung cancer among the nonsmoking wives of cigarette smokers. Another study, however, found little if any risk for these "passive smokers."

The question has not been resolved, and there is cause for concern. Therefore, the American Cancer Society believes that further research is urgently needed. The Society's new Cancer Prevention Study II, involving more than one million Americans includes a careful assessment of cancer risk and other diseases among smokers and passive smokers.

INDUSTRIAL HAZARDS

Industrial workers are especially susceptible to lung diseases due to the combined effects of cigarette smoking and exposure to toxic industrial substances such as fumes from rubber polymers, chlorine and dust from cotton and coal. Exposure to asbestos in combination with cigarette smoking increases an individual's cancer risk nearly 60 times.

In his 1982 report, The Health Consequences of Smoking, U.S. Surgeon General C. Everett Koop confirmed many of the ACS findings, declaring that cigarette smoking is "the chief, single, avoidable cause of death in our society, and the most important health issue of our time."

BREAST CANCER

Incidence: An estimated 115,000 new cases in the United States during 1984. About one out of 11 women will develop breast cancer at some time during their lives.

Mortality: An estimated 37,300 deaths in 1984. It is the foremost site of cancer deaths in women.

Warning Signals: Breast changes that persist such as a lump, thickening, swelling, dimpling, skin irritation, distortion, retraction or scaliness of the nipple, nipple discharge, pain or tenderness.

Risk Factors: Over age 50; personal or family history of breast cancer; never had children; first child after age 30.

Early Detection: The American Cancer Society recommends the monthly practice of breast self-examination (BSE) by women 20 years and older as a routine good health habit. Most breast lumps are not cancer, but only a physician can make a diagnosis.

The American Cancer Society and the National Cancer Institute, in their joint Breast Cancer Detection Demonstration program, found that mammography—a low-dose x-ray examination—could find cancers too small to be felt by the most experienced examiner.

Besides its effectiveness in screening women without symptoms, mammography is recognized as a valuable diagnostic technique for women who do have findings suggestive of breast cancer. Once a breast lump is found, mammography can help determine if there are other lesions in the same or opposite breast which are too small to be felt. All suspicious lumps should be biopsied for a definitive diagnosis—even when the mammogram is described as normal.

The Society recommends a mammogram every year for asymptomatic women age 50 and over, and a baseline mammogram for those 35 to 39. Women 40 to 49 should have mammography every 1-2 years, depending on physical and mammographic findings as well as other risk factors. In addition, a professional breast examination is recommended every three years for women 20 to 40, and every year for those over 40.

Techniques such as thermography (heat patterns), ultrasound (high-frequency sound waves) and diaphonoscopy (inspection with a beam of light) are currently being studied for their possible effectiveness in detecting early breast cancer. At present these techniques have not been proven to be as effective as mammography.

Treatment: Several methods may be used, depending on the individual woman's preferences and medical situation—surgery varying from local removal of the tumor to mastectomy, radiation therapy, chemotherapy or hormone manipulation. Often two or more methods may be used in combination. Patients should discuss with their physicians possible options available concerning the specific management of their breast cancer.

New techniques in recent years have made breast reconstruction possible after mastectomy, and the cosmetic results are good. Reconstruction now has become an important part of treatment and rehabilitation.

Survival: The five-year survival rate for localized breast cancer has risen from 78% in the 1940's to 87% today. If the cancer has spread, however, the rate is reduced to 47%.

Despite an increasing incidence of breast cancer, longer survival has helped to stabilize mortality rates over the last 50 years.

UTERINE CANCER

Incidence: An estimated 55,000 new invasive cases in 1984, including 16,000 cases of cancer of the cervix, and 39,000 cases of cancer of the endometrium or body of the uterus. Invasive cervical cancer incidence has steadily decreased over the years, while cancer in situ has risen in all groups. Cervical cancer is most common today among low socioeconomic groups. Endometrial cancer afflicts mostly mature women, and diagnosis usually is made between the ages of 50 and 64.

Mortality: An estimated 6,800 deaths in 1984 from cervical cancer, 2,900 from endometrial cancer. Overall, the death rate from uterine cancer has decreased more than 70% during the last 40 years, due mainly to the Pap test and regular checkups.

Warning Signals: Intermenstrual or postmenopausal bleeding or unusual discharge.

Risk Factors: For cervical cancer, early age at first intercourse, multiple sex partners. For endometrial cancer, history of infertility, failure of ovulation, prolonged estrogen therapy and obesity.

Early Detection: The Pap test, an examination under a microscope of cells from the cervix and body of the uterus, is a simple procedure which can be performed at appropriate intervals by physicians as part of every pelvic examination. For the average risk person, a Pap test is recommended once every three years after two initial negative tests one year apart.

The Pap test is highly effective in detecting early cancer of the uterine cervix; it is only 50% effective in detecting endometrial cancer. Women at high risk of developing endometrial cancer should have an endometrial tissue sample at menopause.

The hormone estrogen frequently is given to women during and after menopause to make up for the decline in estrogens normally produced by the ovaries. Estrogen helps to control menopausal symptoms such as hot flashes or thinning of the vaginal lining causing painful sexual intercourse. For older women, there are certain risks associated with such treatment, including an increased risk of endometrial cancer. However, estrogen can be given safely under careful physician control.

Treatment: The uterine cancers generally are treated by surgery or radiation, or by a combination of the two. In precancerous (in situ) stages, changes in the cervix may be treated by cryotherapy (the destruction of cells by extreme cold), by electrocoagulation (the destruction of tissue through intense heat by electric current) or by local surgery. Precancerous endometrial changes may be treated with the hormone progesterone.

Survival: The 5-year survival rate for cervical cancer patients, whites and blacks, is 57%. For patients diagnosed early, however, the rate is 80-90%. Cancer in situ is virtually 100%. The figures for endometrial cancer are 75% all stages, 88% early and virtually 100% for endometrial precancerous lesions. During a recent 10-year period, there was moderate improvement for both uterine sites.

COLON AND RECTUM CANCER

Incidence: An estimated 130,000 new cases in 1984, including 90,000 of colon cancer and 40,000 of rectum cancer. Their combined incidence is second only to that of lung cancer (excluding common skin cancers).

Mortality: An estimated 59,400 deaths in 1984, second only to lung cancer.

Warning Signals: Bleeding from the rectum, blood in the stool, change in bowel habits.

Risk Factors: Personal or family history of colon and rectum cancer; personal or family history of polyps in the colon or rectum; ulcerative colitis.

There is suggestive evidence that bowel cancer may be linked to environmental factors, such as dietary patterns. Some scientists believe that a diet high in beef and/or deficient in fiber content may be a significant causative factor.

Early Detection: The ACS recommends three tests as valuable aids in detecting colon and rectum cancer early in people without symptoms.

The digital rectal examination is performed by a physician during an office visit. The ACS recommends one every year after age 40.

The stool blood slide test is a simple method of testing the feces for hidden blood. The specimen is obtained by the patient at home, and returned to the physician's office for examination. The ACS recommends the test every year after 50.

Proctosigmoidoscopy, known as the "procto," is an examination in which a physician inspects the rectum and lower colon with a hollow, lighted tube, traditionally 25 cm long. As the site of most colorectal cancer appears to be shifting higher in the colon, longer, flexible instruments are being used. Now available is a 35 cm sigmoidoscope, thought to be more suited to routine use in doctors' offices. It is expected to be able to detect more than 60% of all colorectal cancers. The ACS recommends a procto every 3 to 5 years after the age of 50, following two annual exams with negative results.

If any of these tests reveals possible problems, a physician may recommend more extensive studies, such as colonoscopy and a barium enema for contrast X rays. The longest available colonoscope is capable of viewing the entire colon with a flexible, lighted tube. The colonoscope also can biopsy suspicious tissue.

A national ACS study on colon and rectum cancer attitudes of the public* found that Americans over age 40 tend to pay these organs scant attention and have them checked infrequently by their physicians. Most study participants incorrectly thought the disease usually is found in an advanced stage when survival chances are slim. Many also erroneously regarded a permanent colostomy as a normal result of colon and rectum cancer. On the other hand, participants were receptive to accurate information about the disease, and expressed a willingness to practice early detection procedures.

Treatment: Surgery is the most effective method of treating colorectal cancer, but radiation and chemotherapy are being used in combination with surgery in some cases. A colostomy—the creation of an abdominal opening for the elimination of body wastes—can be either temporary or permanent. In cases of colon cancer, permanent colostomies are rare, and are required infrequently for patients with rectal cancer. One report found permanent colostomies necessary for only 15% of patients whose rectal cancers are detected early. For those who do have permanent colostomies, the Society has a special program to help patients adjust.

Survival: When colorectal cancer is detected and treated in an early, localized stage, the five-year survival rate is 76% for colon cancer and 73% for rectal cancer, compared with 28% and 23% respectively, after the cancer has spread to other parts of the body.

*Leo J. Shapiro & Assoc., Inc., 1982

SKIN CANCER

Incidence: An estimated 400,000 cases a year, the vast majority of which are highly curable basal or squamous cell cancers. They are more common among individuals with lightly pigmented skin, living at latitudes near the equator. The most serious skin cancer is malignant melanoma, which strikes about 18,000 men and women each year.

Mortality: An estimated 7,400 deaths a year, 5,500 from malignant melanoma, and 1,900 due to other skin cancers.

Warning Signals: Any unusual skin condition, especially a change in the size or color of a mole or other darkly pigmented growth or spot.

Risk Factors: Excessive exposure to the sun; fair complexion; occupational exposure to coal tar, pitch, creosote, arsenic compounds and radium. In the black population, because of heavy skin pigmentation, skin cancer is negligible.

Prevention: Avoid the sun between 10 a.m. and 3 p.m. when ultraviolet rays are strongest, and by using protective clothing. Use one of the growing number of sunscreen preparations, especially those containing such ingredients as PABA (para-aminobenzoic acid). They come in varying strengths, ranging from those that permit gradual tanning to those allowing practically no tanning at all.

Early Detection: Basal and squamous cell skin cancers often take the form of a pale, waxlike, pearly nodule, or a red, scaly, sharply outlined patch.

Melanomas are usually distinguished by a dark brown or black pigmentation. They start as small, mole-like growths that increase in size, change color, become ulcerated and bleed easily from a slight injury.

Treatment: There are four methods of treatment—surgery, radiation therapy, electrodesiccation (tissue destruction by heat), or cryosurgery (tissue destruction by freezing).

For malignant melanoma, wide and deep surgical excision and the removal of nearby lymph nodes are often required.

Survival: For basal cell and squamous cell cancers, cure is virtually assured with early detection and treatment.

Malignant melanoma, however, metastasizes quickly. This fact accounts for the lower 5-year survival rate for white patients with this disease—68% compared with 95% for patients with other kinds of skin cancer.

ORAL CANCER

Incidence: An estimated 27,500 new cases in 1984. Incidence is more than twice as high in males as in females, and is most frequent in men over age 40. Cancer can affect any part of the oral cavity, from lip to tongue to mouth and throat.

Mortality: An estimated 9,350 deaths in 1984.

Warning Signals: A sore that bleeds easily and doesn't heal; a lump or thickening; a reddish or whitish patch that persists; difficulty in chewing, swallowing or moving tongue or jaws.

Risk Factors: Heavy smoking and drinking; use of chewing tobacco.

Early Detection: Dentists have the opportunity, through regular checkups, to see abnormal tissue changes and to detect cancer at an early and curable stage.

Treatment: Principal methods are surgery and radiation therapy.

Survival: Five-year survival rates vary substantially depending on the site, and include slight declines as well as improvements over a recent 10-year period. Rates range from 22% for cancer of the pharynx to 84% for lip cancer. Overall, 5-year survival for oral cancer patients is about 40%.

LEUKEMIA

Incidence: An estimated 24,000 new cases in 1984, about half of them acute leukemia, and half of them chronic leukemia. Although it is often thought of as primarily a childhood disease, leukemia strikes many more adults (21,500 cases per year compared with 2,500 in children). Acute lymphocytic leukemia accounts for about 1,800 of the cases of leukemia among children, whereas in adults the most common types are acute granulocytic (about 6,800 cases annually), and chronic lymphocytic (7,600 cases annually).

Mortality: An estimated 16,700 deaths in 1984.

Warning Signals: Acute leukemia in children appears suddenly, with symptoms similar to those of a cold, and progresses rapidly. Lymph nodes, spleen and liver become enlarged with white blood cells that accumulate in those organs. Early signs may include fatigue, paleness, weight loss, repeated infections, easy bruising, nose bleeds or other hemorrhages. Symptoms of advanced leukemia include extreme fatigue, massive hemorrhages, pain, swelling of gums and various skin disorders. Chronic leukemia progresses slowly and without warning signs. Symptoms, similar to those of acute leukemia, may not appear for years.

Risk Factors: Leukemia, a cancer of the blood-forming tissues, strikes both sexes and all ages. Causes of most cases are unknown. There is some evidence of inherited susceptibility, although not for direct transmission from parent to child. Individuals with Down's syndrome (mongolism) and certain other hereditary abnormalities have higher than normal incidence of leukemia. It has also been linked to excessive exposure to radiation and certain chemicals such as benzene.

Early Detection: Leukemia may be difficult to detect early because symptoms often appear to be those of other less serious conditions. When a physician does suspect leukemia, a diagnosis can be made through blood tests and a biopsy of bone marrow.

Treatment: Chemotherapy is by far the most effective initial method of treating leukemia patients. Today, continuing research in 80 U.S. medical centers is yielding new and better drugs for treating leukemia patients. A variety of anticancer drugs are used singly or in combinations. In certain patients, especially children with acute lymphocytic leukemia, x-ray therapy of the central nervous system is used following chemotherapy.

All blood-forming tissues release millions of each type of cell daily into one of the body's two circulatory systems–the blood vessel system and the lymph system. When leukemia strikes, millions of abnormal, immature white blood cells called leukocytes are released into these circulatory systems.

Because these cells are immature, they cannot carry out their basic function of fighting infection. In advanced leukemia, the uncontrolled multiplication of abnormal cells results in crowding out the production of normal white cells to fight infection, of platelets to control

hemorrhaging and of red blood cells to prevent anemia. Blood transfusions and antibiotics are used as supportive treatment.

Survival: The overall, average 5-year survival rate for white patients with leukemia (black information is insufficient) is 15%, due partly to very poor survival of patients with some types of leukemia such as acute granulocytic. Over a recent 10-year period, however, there was a dramatic improvement in survival of patients with acute lymphocytic leukemia: 4%-27% in white males, 3%-29% in white females, and 4%-34% in white children. Moreover, in some medical centers, optimum treatment has raised survival of children with acute lymphocytic leukemia to between 50% and 75%.

CANCER IN CHILDREN

Incidence: An estimated 6,000 new cases in 1984, making it rare as a childhood disease. Cancers in children, however, tend to develop more quickly than adult cancers because body tissues are growing rapidly and the cancer grows right along with them. Common childhood cancer sites include the blood, bone, brain, nervous system and kidneys.

Mortality: An estimated 1,600 deaths in 1984, about half of them from leukemia. Despite its rarity, cancer is still the chief cause of death by disease in children between the ages of 3 and 14. Mortality among children with cancer has declined from 8.3 per 100,000 in 1950 to 4.4 in 1979.

Early Detection: Cancers in children often are difficult to recognize since they may seem like trivial disorders at first. Parents should see that their children have regular medical checkups, and be alert to any unusual symptoms that persist. Such conditions include nausea, swelling, double vision, stumbling, nosebleeds, drowsiness and listlessness.

Main Childhood Cancers:

Leukemia: See preceding section.

Osteogenic Sarcoma is a bone cancer which develops most often in the forearm or lower leg. There is usually no pain at first, but eventually swelling and difficulty in using the arm or leg occur.

Cancers of the Nervous System, known as neuroblastomas, can appear anywhere but usually in the abdomen, where a swelling occurs.

Brain Cancers in early stages may cause blurred or double vision, dizziness, difficulty in walking or handling objects, and nausea.

Lymphomas are cancers that attack the lymph nodes, bone marrow and various organs throughout the body. They may cause swelling of lymph nodes in the neck, armpit, or groin. Other symptoms may include general weakness and possibly fever.

Eye Cancers usually occur in children under the age of four. When detected early, cure is possible with appropriate treatment.

Cancer of the Kidney, or Wilms' Tumor may be recognized by a swelling or lump in the abdomen.

Treatment: Childhood cancers are frequently treated by a combination of therapies, coordinated by a team of experts. They include medical specialists, pediatric nurses, social workers and psychologists who work with children and their families.

Survival: Five-year survival rates for cancer in children vary considerably, depending on the site. Among those for white children (black information is insufficient) are: bone cancer, 30%; neuroblastoma, 40%; glioma (brain), 59%; Wilms' tumor (kidney), 70%; retinoblastoma (eye), 85%; and Hodgkin's disease, 90%.

PUBLIC EDUCATION

Because each year thousands of lives could be saved through cancer prevention and early detection, the Society's Public Education programs are designed to inform people about cancer, tell what they can do to protect themselves, and demonstrate related health practices.

The Society believes strongly in the value of periodic, cancer-related checkups and specific cancer tests, as well as prompt action in the event that one of cancer's seven warning signals occurs.

Six cancer sites offer the greatest opportunity for prevention or cure: lung, colorectal, breast, uterine, oral and skin. Cancers at these sites account for the majority of cancer cases and about half of all cancer deaths.

P-A-C-E STRATEGY

The Society's P-A-C-E (Priority Activities in Cancer Education) planning strategy focuses on the first four of these six sites—where prevention or early detection provides the biggest payoff in lives saved.

ACS Public Education programs are divided into two major audience categories: adults and youth. Adults are reached through the workplace, clubs and organizations, home and neighborhood, and through programs with other health agencies. Youth programs are organized according to school grade: kindergarten through 6th, 7th through 9th, and 10th through 12th. These programs teach young people good health habits, help them make

lifestyle decisions and understand health behavior as it relates to cancer.

Programs for adults are carried out in small group settings or on a one-to-one basis, involving two-way communication and interaction. Whenever possible, volunteers are selected on the basis of skills that can be readily adapted to Society work, such as ex-smokers with group experience who help in smoking cessation programs, and nurses who can teach breast self-examination to groups of women. The Society reinforces its Public Education messages with a variety of films, filmstrips, pamphlets and posters.

CANCER-RELATED CHECKUP GUIDELINES

Guidelines for the early detection of cancer in people without symptoms are recommended by the American Cancer Society as follows:

A cancer-related checkup:

- every 3 years for those 20-40 years of age.
- every year for those 40 and over.

The Society advises: "Talk with your doctor—ask how the guidelines relate to you." The checkup should always include health counseling (such as tips on quitting smoking) and examinations for cancer of the thyroid, testes, prostate, mouth, ovaries, skin and lymph nodes.

In particular:

- Ages 20-40—For breast cancer, an examination by a physician every three years, a self-exam every month, and one baseline breast X ray between the ages of 35 and 40. For uterine cancer, a pelvic exam every three years and a Pap test at least every three years after two initial negative tests one year apart (including women under 20 if sexually active.)
- Ages 40 and over—For breast cancer, a professional exam every year, a self-exam every month and a breast X ray every 1-2 years for those 40-49; every year for those 50 and over. For uterine cancer, a pelvic exam every year, a Pap test at least every three years (after two negative tests a year apart), and an endometrial tissue sample at menopause, if at risk. For colon and rectum cancer, a digital rectal exam every year after 40, and a stool blood test every year after 50 as well as a procto exam every 3-5 years after two initial negative tests one year apart.

Some people are at higher risk for certain cancers and may need to have tests more frequently. See individual cancer site sections for high risk factors.

REACHING MORE PEOPLE

In fiscal 1983, local ACS Public Education programs involving two-way communication were expected to have reached 13 million adults and over 25 million young people.

For the rest of the decade, the Society has set specific behavioral goals of persuading more Americans to have tests for colorectal cancer, reducing the number of smokers, and increasing the number of women who practice monthly breast self-examination, get Pap tests and have endometrial tissue samples taken.

In 1984, the Society is embarking on a three-year special project—Colorectal Health Check—to reach more Americans with Public Education programs on colon and rectum cancer.

In addition to the Society's intensive, person-to-person educational outreach, broader ACS programs blanket the nation with lifesaving messages. During the annual Cancer Crusade, volunteers make personal home visits, urging individuals to protect themselves against cancer.

More than 60 million educational leaflets are distributed each year, and important cancer educational messages reach nearly every U.S. household through television, radio and the print media.

PROFESSIONAL EDUCATION

ACS Professional Education programs bring the latest developments in cancer to the medical community: members and students of the medical, dental, nursing and allied health professions.

National conferences, clinical fellowships, Division- and Unit-level meetings, workshops and scholarships provide information and training in the prevention and early detection of cancer, and in the treatment and rehabilitation of cancer patients.

AUDIOVISUALS, JOURNALS

Films, videotapes, slide sets, audiotapes, publications and exhibits are also available for Professional Education programs in hospitals as well as in medical, dental and nursing schools, and are used by professional societies at local and national meetings.

The ACS publishes *Ca-A Cancer Journal for Clini-*

cians, which is directed particularly to the primary care physician and has a total circulation of more than 450,000. The Society supports the publication of the journal *Cancer*, directed to those specializing in the care of the cancer patient.

The Society maintains a library of Professional Education motion pictures, available in 16mm and 8mm cartridge formats, as well as in 3/4-inch videocassettes. All are distributed through ACS Divisions and Units on a free loan, five-year lease or direct sale basis.

An ACS national conference on Breast Cancer was held May 19-21, 1983 in Boston, with some 1,400 in attendance. Other national conferences scheduled for 1983 are on Cancer Nursing, Sept. 22-24 in Anaheim, Calif., and on Advances in Cancer Therapy, Dec. 8-10 in New York City.

NURSING PROGRAMS

Cancer Nursing News, a newsletter sent to about 80,000 nurses, began publication in 1982. The newsletter keeps nurses up to date on cancer, oncology nursing, the American Cancer Society, and opportunities in continuing education. The newsletter is sent free to any nurse who desires it. Requests for subscriptions should be sent to the Executive Editor, *Cancer Nursing News*, c/o American Cancer Society, 4 West 35th St., New York, NY 10001.

The Society initiated in 1981 a program of nursing scholarships. Twenty one-year scholarships are awarded each year to qualified graduate students studying for a master's degree with a specialty in cancer nursing. The recipients are then eligible to apply for a second year's funding.

Another recently launched program, "Clinical Professorships in Oncology Nursing," provides a means for ACS Divisions to support selected individuals who will develop high quality cancer teaching programs in the nursing field.

CLINICAL FELLOWSHIPS & PROFESSORSHIPS

The ACS National Clinical Fellowship program since 1948 has spent more than $37 million to train some 7,000 physicians and dentists in the diagnosis and treatment of cancer. Training is provided on two levels at centers and hospitals with qualified training programs.

The regular Clinical Fellowship program—for hospital residents—is designed to improve the management of the patient with cancer by supporting clinical oncology training for young physicians and dentists.

The Junior Faculty Clinical Fellowship program—for postresident physicians and dentists—is intended to strengthen cancer teaching programs by supporting outstanding young clinicians in academic careers, upon completion of their specialty training.

Fellows put their special skills and knowledge to work through their professional societies, teaching activities, participation in hospital cancer programs and their private practices. Many new departments and divisions of oncology in hospitals and medical schools are now headed by former ACS Fellows. During 1983-1984, training will be supported for 361 Regular Clinical Fellows and 143 Junior Faculty Clinical Fellows.

The ACS supports a program for Professors of Clinical Oncology designed to bring about more effective management of cancer patients by improving cancer teaching in medical schools. Each grant pays up to $25,000 a year for 3-5 years toward the salary of each of the current 17 ACS Professors of Clinical Oncology.

UNPROVEN METHODS OF CANCER MANAGEMENT

The American Cancer Society maintains an extensive reference center for the collection and dissemination of data on unproven methods of cancer management. This information is available on request to physicians, science writers, editors and the general public, to assist in evaluating claims made for unproven methods of cancer prevention, detection, diagnosis and treatment.

ACS Divisions are actively involved in encouraging passage of state legislation to curb the use of unproven methods of cancer management.

Many unproven methods of cancer management are followed closely. Those that do not conform to established medical, scientific, ethical or legal standards are reviewed regularly for any change in their status. Periodic in-depth review of information on these methods is carried out.

The Society always welcomes new developments which have been proven scientifically effective and safe in the prevention, detection, diagnosis or treatment of cancer.

SERVICE AND REHABILITATION

As part of its comprehensive efforts in cancer control, the American Cancer Society extends a "warm hand of service" to all cancer patients and their families, by conducting extensive programs in many areas. In 1983, these programs reached more than 400,000 patients.

In 1984, Units and Divisions of the Society are accelerating their service efforts, improving coordination and streamlining operations, partly through computerization. Many programs help patients adjust to new patterns of therapy and return to a full and productive life after cancer.

Among the different kinds of help provided by ACS Units and Divisions are:

(1) Up-to-date cancer information and guidance for patients and their families so they will know what to expect and where to turn for help in their community; (2) Home care services, providing loans and gifts of sickroom supplies and special comfort items for the homebound patient, such as hospital beds and wheelchairs, dressings, wigs and walkers; (3) Transportation for cancer patients, provided by volunteers who take them to and from doctors' offices, clinics and hospitals for diagnosis, treatment and rehabilitation; (4) Visitor rehabilitation programs that offer patients a one-to-one relationship with someone who has been through and coped successfully with their specific kind of cancer; (5) Rehabilitation through self-help and support groups that serve a variety of special needs of cancer patients and their families; and (6) Patient/family education through organized programs that bring health professionals into direct contact with patients and their families in small groups, and through a variety of educational materials.

REACH TO RECOVERY

Women with breast cancer today have a growing number of rehabilitation options to choose from. Reach to Recovery is one of the first and largest of the Society's patient visitor programs.

Volunteers, women who already have adjusted successfully to their own mastectomies, visit new patients with their physician's consent. These visits are made both preoperatively and after surgery. They serve as living proof that women who have had a mastectomy can look attractive and return to active, normal lives.

One of the newer aspects of Reach to Recovery is providing information to post-mastectomy patients who are considering breast reconstruction. Updated materials also focus on the special needs of minority groups and single women who have had breast cancer treatment. Through this program, women can make informed choices on most aspects of breast cancer rehabilitation.

CANSURMOUNT

This specially-matched, patient-to-patient visitor program began in Colorado and now has spread to many parts of the United States as well as a number of other countries. Its one-to-one format is similar to Reach to Recovery, but it helps those with all kinds of cancer, pairing up volunteers and new patients according to age, personality, cancer, treatment and background.

With approval of the attending physician, these carefully selected and trained volunteers provide invaluable help—someone for the patient to see and talk with who has successfully coped with the same kind of cancer and the same treatment. Confidentiality is maintained in all cases.

OTHER VISITOR PROGRAMS

International Association of Laryngectomees (IAL)—Members of this ACS-affiliated network of 325 clubs have had their larynx (voice box) removed, usually because of cancer. Those who have adjusted well and learned new ways of speaking visit patients still in the hospital after surgery, bringing the message that a laryngectomee can return to a normal life.

Ostomee Rehabilitation Program—Some patients with intestinal or urinary cancers must have abdominal ostomies—surgically constructed openings for the elimination of body wastes. Special visitors who have had such surgery visit new ostomy patients to offer encouragement and support.

PATIENT EDUCATION

I Can Cope—is a patient/family education program designed to offer information about cancer, its treatments and ways of coping with the physical and emotional effects of the disease. The program provides classroom structure while allowing the flexibility to be unique in meeting community needs. Classes are taught by physicians, nurses, social workers and other community professionals.

The Society now is planning an expansion of its patient education services, and is preparing a variety of pamphlets, books, and audiovisual aids to help patients and their families understand the complexities of cancer and how to deal with them.

EVOLVING PROGRAMS

Transportation—The need for more volunteers to help transport patients to medical facilities for regular outpatient chemotherapy and radiation therapy prompted the National Society to adopt a highly successful Massachusetts program, called Road to Recovery. Making maximum use of media recruitment, that Division was able to increase its force of volunteers by 400%. The program emphasizes the training and retention of volunteer drivers.

Information—The increasing demand by patients and their families for up-to-date, comprehensive cancer information has resulted in the National Society taking a more active role in providing this kind of information. A number of new initiatives are now in the development stage.

CANCER AND THE ENVIRONMENT

Most cancer cases in the United States are believed to be environmentally related, that is, associated in some way with our physical surroundings, personal habits or lifestyles.

Occupational hazards, although associated with only a small percentage of cancers, are under close surveillance. Virtually every suspected major chemical and other substance in the workplace presumed to be a health risk is under investigation. Each study can require years and hundreds of thousands of dollars to complete.

Some environmental causes of cancer are well known. About 30% of all cancers are directly related to the use of tobacco, either alone or in conjunction with excessive consumption of alcohol.

Other causes are harder to determine. Diet is suspected as an important element in cancer risk. However, dietary factors are difficult to study, and so far, the evidence has not been conclusive.

To help identify environmental factors in human cancer, the American Cancer Society has undertaken a three-part program of environmental cancer research. This involves (1) Cancer Prevention Study II, a new epidemiologic study to examine the relationship of environment and lifestyle to cancer development; (2) studies of groups exposed to industrial substances suspected of causing cancer, and (3) support of extramural cancer cause and prevention research projects.

CANCER PREVENTION STUDY II

One of the largest research studies ever carried out in the United States was launched in 1982. Cancer Prevention Study II, a long-term prospective study, is examining the habits and exposures of more than one million Americans to learn how lifestyles and environmental factors affect the development of cancer.

Modeled after the first ACS Cancer Prevention Study (1959-1972), CPS-II is similar in method but wider in scope and involves more participants.

Over 75,000 volunteers were mobilized to enroll 1.2 million men and women in the study. These volunteer researchers distributed a four-page confidential questionnaire to participants, who were asked about their exposures to certain environmental conditions, their history of disease and lifestyle. The questionnaires were designed to elicit over 500 pieces of information each, information which is computerized for statistical analysis.

Many of the questions focus on health issues of current concern. These include risks of certain drugs, foods and various occupational exposures; low-tar and nicotine cigarettes; consumer products; long-term exposure to low-level radiation; and the health effects associated with air and water pollution.

For a period of six years, and possibly longer, the volunteers will keep track of the status and whereabouts of study participants. Follow-ups are scheduled for 1984, 1986 and 1988. Various suspected relationships will be tested by comparing mortality records of differently exposed groups.

The study's goal is to identify those factors that increase a person's chances of getting cancer, those that carry little or no risk, and those that actually may help to prevent cancer. With this information, the Society will be able to sign and promote more effective educational programs in cancer prevention.

The Society's first Cancer Prevention Study resulted in important findings about health and disease. Study data provided overwhelming evidence that cigarette smoking is now the major cause of lung cancer and an important factor in other cancers. It also furnished information on risks of heart disease and other serious illnesses, and revealed a relationship between obesity and certain cancers.

Since the first study, new factors in our environment have been identified that may be related to cancer. The Society decided to initiate a second study to respond to concerns of the public and scientific community about suspected carcinogens.

Without the use of ACS volunteers, the cost of carrying out the study would total more than $100 million. With volunteers to collect the data, the study is estimated to cost only about $9 million to complete.

STUDIES OF OCCUPATIONAL GROUPS

A number of studies of union workers exposed to various agents have been undertaken in the Society's Intramural Research Program; the findings will have considerable public health implications.

It has been established that asbestos workers have a high risk of lung cancer, gastrointestinal cancer and other conditions. Less clear, though, is the hazard asbestos exposure poses for the general population, particularly among people exposed to very low levels.

The ACS is studying the mortality of family members of asbestos factory workers and insulation workers to determine if they are at an increased risk of lung cancer and other asbestos-related diseases. A study of shipyard workers will offer data on this group's cancer incidence and mortality rates.

In a current study, it may be learned how smoking cessation affects the lung cancer risk of insulation workers who no longer work with asbestos materials.

Other occupational groups under continuing investigation include vinyl chloride workers, painters, rubber plant employees, those who work with polychlorinated biphenyls (PCB's), printing press workers, and health care and hospital employees.

SPECIAL INSTITUTIONAL GRANTS

As part of its continuing program to provide substantial and relatively long-term support for major institutions engaged in cancer cause and prevention research, the American Cancer Society awarded grants to the following institutions in 1983:

- Institute of Environmental Medicine, New York University Medical Center, New York, N.Y. (Dr. Arthur C. Upton), to conduct a broad spectrum of studies dealing with such subjects as DNA interactions, risk assessment and nutrition.
- Massachusetts Institute of Technology, Boston, Mass. (Dr. Gerald N. Wogan), to use innovative techniques to detect changes in DNA, hemoglobin and albumin, and changes in T-cells that could signal relatively low exposures to carcinogens; together with the Harvard School of Public Health (Dr. Brian MacMahon) for biochemical studies of cancer risks, involving such groups as smokers, nonsmokers and those with particular dietary habits.
- Milton Hershey Medical Center, Pennsylvania State University, Hershey, Pa. (Dr. Fred Rapp), to research the cause, course and prevention of metastatic tumor growth.

Previously awarded grants to the following institutions are still in effect:

- The American Health Foundation, New York, N.Y., to conduct epidemiologic studies, health behavior evaluations, and biochemical analyses of various consumer products.
- Temple University School of Medicine, Philadelphia, Pa., for an ongoing study of cancer prevention and analyses of chemical and environmental carcinogens.
- Memorial Sloan-Kettering Cancer Center, New York, N.Y., to identify candidates at high risk to colorectal cancer.
- University of Minnesota, Minneapolis, for a study of inhibitors of carcinogenesis found in diet.
- Mount Sinai School of Medicine, New York, N.Y., for collecting and disseminating information on reported environmental carcinogens.
- The Johns Hopkins University School of Medicine, Baltimore, Md., to develop new methods of protecting against cancer-causing influences, with special emphasis on the hazards of medical drugs.
- The University of Southern California School of Medicine, Los Angeles, to study the possible relationship of cancer to specific occupational, drug or other environmental exposures.

COSTS OF CANCER

A study by the National Center for Health Statistics (NCHS) puts overall medical costs for cancer at $10.8 billion for 1980. Because medical care costs have been inflating at 20% or more a year, that figure could easily have doubled by now.

In the NCHS study, 67% of the total amount was spent for hospital care, 23% for physicians' services, 5% for drugs, 4% for nursing home care, and 1% for other professional services.

Individual costs vary considerably, depending on the location of the cancer, possible recurrences and the extent of follow-up care. Daily hospital fees alone can run $250 or more a day, and each course of therapy can amount to several thousand dollars.

A study by the Blue Cross and Blue Shield Association estimates that the average American who died of cancer in 1983 ran up more than $22,000 in medical bills during the final year of life. The study, based on cases in Michigan, Indiana and Georgia, was funded by the U.S. Health and Human Services Department.

Individuals have several sources of help in paying for cancer costs: third-party payers such as Blue Cross and private insurance companies, public agencies and private health organizations. Cancer is covered by personal insurance plans either under narrowly defined cancer policies or through catastrophic illness provisions in comprehensive insurance programs.

The Third National Cancer Survey showed that for pa-

tients under 65 years, Blue Cross and private insurers were the source of payment in over 77% of the cases. For patients over 65, Medicare paid expenses in nearly 88% of the cases.

Hospital costs can be reduced substantially through the use of nursing facilities, hospices for advanced cancer patients, and home care with periodic professional medical visits.

SOURCES OF INCOME

Financial support of the American Cancer Society in fiscal 1983 is estimated to exceed $196 million from public sources. The Cancer Crusade raised about $146 million. National Headquarters and chartered Divisions received some $50 million from bequests and legacies. The Public has given generous and growing support to the Crusade over the years. In 1946, for example, the Society raised over $10 million. Thirty-five years later, in 1981, that figure had soared to more than $170 million.

Legacies — in which the Society becomes beneficiary of willed funds — are an increasingly important source of ACS income. Income from legacies indicates confidence in the leadership of the Society and a determination by many Americans to continue the fight against cancer even after their lifetimes. Legacy income in relation to Crusade receipts is shown below.

Year	Crusade	Legacies	Year	Crusade	Legacies
1973	67,784,862	25,228,782	1978	95,927,848	30,178,722
1974	72,152,315	24,116,620	1979	102,778,011	39,360,721
1975	78,788,160	31,056,259	1980	113,325,055	41,366,087
1976	84,882,450	33,968,066	1981	124,615,571	45,792,632
1977	90,120,508	24,605,566	1982	135,197,106	47,799,594

THE AMERICAN CANCER SOCIETY

The American Cancer Society, Inc. is a national voluntary health organization of 2.5 million Americans united to conquer cancer through balanced programs of research, education, patient service and rehabilitation.

Organization: The American Cancer Society, Inc. is composed of a National Society, with 58 chartered Divisions and 3,128 Units.

The National Society: A 196-member House of Delegates provides a basic representation from the 58 Divisions and additional representation on the basis of population. It elects and is governed by a Board of Directors of 119 voting members, approximately half of whom are members of the medical or scientific professions.

The National Society is responsible for overall planning and coordination, and provides technical help and materials to Divisions and Units. The National Society administers programs of research, medical grants and clinical fellowships, and is charged with carrying out public and professional education on the national level.

The 58 Divisions: These are governed by 3,847 members of Divisional Boards of Directors, both medical and lay, in all the states plus six metropolitan areas, the District of Columbia and Puerto Rico.

The Units: These are organized to cover the 3,130 counties in the United States. There are more than 77,000 community leaders who direct the Society's programs at this level. The basic strength of the Society lies in the loyal ranks of volunteers fighting cancer in their communities.

The Programs: The Society maintains its priorities and goals through activities developed by the departments of Research, Professional Education, Public Education, Public Information, Epidemiology and Statistics, Service and Rehabilitation, and Crusade.

RESEARCH

The American Cancer Society is one of the largest sources of cancer research funds in the United States, second only to the National Cancer Institute, an agency of the Federal government.

The Society's overall investment in research each year has grown steadily from $1 million in 1946 to almost $57 million* today. This sum represents nearly a third of the total ACS budget. To date, the Society has invested more than half a billion dollars in cancer research.

The program focuses primarily on investigator initiated projects, rather than directed research undertaken on a contract basis. With the exception of staff and facilities to carry out its epidemiological studies (see next section), the ACS neither hires staff researchers nor operates its own laboratories. This gives the Society the freedom to place its grants where innovative and promising ideas are being explored.

A key factor in the role of the Society in cancer re-

*Subject to audit

search is providing qualified scientists with alternative funding sources to carry on their work. The Society believes it can make most effective use of its research funds by supporting scientists working in established medical institutions across the country. In this way there is a minimum of overhead and a maximum of flexibility to make sure that research money has the highest probability of yielding results that will benefit people.

Applications for ACS grants are put through a rigorous process of evaluation, beginning with careful study by the appropriate one of 11 scientific review committees and two additional groups of experts. It must be given final approval by the National Board of Directors.

KINDS OF GRANTS

The Society's research program is diverse in concept and recipients. It provides support both for established scientists and those starting out on their own independent research. It funds postdoctoral training for promising young investigators and stimulates new ideas in cancer research among those working in universities, institutes and teaching hospitals.

Overall, the program offers five types of grants: (1) Research and Clinical Investigation Grants to finance investigator-initiated research; (2) Institutional Research Grants to universities, institutes and hospitals to support pilot studies and the work of young investigators in cancer; (3) Research Personnel Grants to outstanding scientists and students specializing or planning to specialize in cancer research; (4) Research Development Program Grants to provide rapid funding for priority projects; and (5) Special Institutional Grants for Cancer Cause and Prevention Research to provide longer term funding.

Research Professorships. The Research Professorship grant program, unique in the field, has been in existence since 1957. The Society supports 23 of the nation's most gifted scientists until retirement. These are people devoting their life's work to cancer research. Freed of major administrative responsibilities and other restrictions, they can concentrate on their chosen fields of scientific investigation.

Physicians' Training Fellowships. Unique in the research world, this type of Research Personnel Grant was inaugurated in 1981 because of a dearth of MD's in the research field. It provides an opportunity for physicians to take time out from their medical careers over a two-year period and train as researchers.

Research Development Program. This was established to identify and provide rapid funding for high priority projects. Approved applications can be funded in less than three months. This compares with the 10 to 18 months required by the Federal government before a new approved application can be funded.

The kinds of research projects eligible under the Research Development Program include: (1) unique research opportunities which cannot wait for the normal lengthy funding procedures; (2) unanticipated needs relating to research already under way; (3) program coordination, especially that involving clinical trials and the dissemination of research results to community hospitals; and (4) program integration between the American Cancer Society and other health organizations.

All applications are evaluated for—among other considerations—merit, qualifications and productivity of the investigator; relevance, need for rapid funding, and probability of the project's eventual contribution to cancer control. More than $10 million has been appropriated so far to the Research Development Program, over half of which has been for interferon research.

Interferon Research. Interferon, a natural body protein, was discovered as an antiviral agent and later found to have some anticancer activity. In 1978, the Society invested an unprecedented $2 million to purchase interferon for clinical trials. The substance was extremely scarce and expensive, since it was obtained from human blood cells.

The first tests were performed on carefully selected patients in 15 U.S. institutions, and included 175 patients. Four types of cancer were in the study—multiple myeloma, melanoma, breast cancer and non-Hodgkin's lymphoma. Additional studies involving melanoma, advanced kidney cancer and nasopharyngeal cancer are being conducted at five institutions.

So far, a number of patients have shown some response to interferon, ranging from those whose steady downhill course was stabilized, to those whose tumors disappeared entirely. It is still too early to tell what the long-term effects will be.

In working with interferon, scientists discovered that there are at least three different types, each produced by different cells, and potentially capable of different activity. In addition, large quantities of interferon now can be produced using the techniques of recombinant DNA. It is far cheaper and purer than the original human blood substance.

In early 1980 the Society allocated an additional $4.8 million for interferon research. This in part permitted a study to be conducted using a different type of interferon, one produced by fibroblast cultures. This interferon is being studied at 12 institutions in advanced prostate cancer, glioblastoma multiforme and soft tissue sarcomas.

Besides the American Cancer Society, sponsors of interferon research in this country include the National Cancer Institute and the National Institute of Allergy and Infectious Diseases.

Ultimately, interferon may be valued not so much for itself, as for its role in heralding a whole new class of compounds called "biologic response modifiers," which will fight cancer by stimulating the body's immune system.

ACS RESEARCH IN THE 80's

In addition to ongoing interferon studies, ACS-funded researchers will continue to investigate broad areas of cancer research in the coming decade. For example, they will be exploring:

Genetic engineering. One method in this new technology, recombinant DNA (gene splicing) is already being used to produce interferon. It has among its potential uses the manufacture of powerful new drugs, correcting impaired immune systems, even modifying heredity by transplanting foreign genes. It is hoped that the process will yield other anticancer activities.

Man-made antibodies such as hybridomas (antibody factories) and the highly specific monoclonal antibodies. Scientists are seeking to find out whether monoclonal antibodies can be produced that will recognize cancer cells only, and thus be able to detect cancer early, before clinical signs appear and when the disease is most curable. Monoclonal antibodies already have been used to deliver drugs directly to tumors, killing them but sparing healthy tissue—i.e., a rifle instead of a shotgun.

Mechanisms of carcinogenesis. Investigators are approaching these key questions from many angles. One model shows that cancer in humans develops in a two-step process—initiation and promotion—as has been found in animals. Other questions include: Are there "proto-oncogenes," normal genes, serving as master switches for early tissue development, which induce normal cells to become cancerous later in life? If so, what turns them on, and can they be programmed to stay off? Do viruses, already known to cause cancer in animals, also cause cancer in humans, perhaps by activation of these proto-oncogenes?

Chemoprevention. People can be protected from cancer by what they eat or drink, or by other substances or lifestyles in general that serve as defense mechanisms. Clues are being pursued by ACS researchers studying such agents as vitamin A; retinoids (synthetic forms of vitamin A); vitamin C; vitamin E; the chemical element selenium, found in the soil; and by other naturally occurring substances in brussels sprouts, cabbage, etc.

Still other ACS investigators are looking for ways to detect cancer earlier by tracing a cell's biochemical markers. They are exploring evidence that the outbreak of the rare skin cancer, Kaposi's sarcoma, is linked to a breakdown in the individual's immune system. And they are testing the hypothesis that certain chemicals enhance a tumor's receptivity to radiation therapy.

THE FINANCIAL RESEARCH PICTURE

In fiscal 1983, the ACS made 646 grants to major institutions in this country and to scientists working here and abroad. The total amount, subject to audit, was nearly $54.1 million. This does not include some $2.5 million granted directly by ACS Divisions. The following table—covering the years 1980 to 1983 inclusive—lists the number of applications received, the total number of dollars required, and those actually funded by the ACS National Office. ACS allocates its funds to effectively carry out its three-pronged attack against cancer: Research, Education and Service.

	REQUESTED		FUNDED	
Year	Number	Amount	Number	Amount
1980	1,931	188,032,301	721	45,615,789
1981	2,069	230,936,242	672	51,960,530
1982	2,475	300,961,755	681	53,953,831
1983	2,564	336,760,146	646	54,132,563

ACS-SUPPORTED NOBELISTS

Since 1946 when Wendell Stanley became the first ACS grantee to receive a Nobel Prize for his work with viruses, 17 other scientists who have received ACS grants have also won Nobel Prizes. Among them: ACS Research Professor Walter Gilbert, Ph.D. and ACS grantee Paul Berg, Ph.D., who shared the 1980 Prize in Chemistry with an English investigator, Dr. Frederick Sanger (not ACS-supported). Gilbert had developed ways to determine the order of a gene's building blocks; Berg pioneered techniques for gene-splicing.

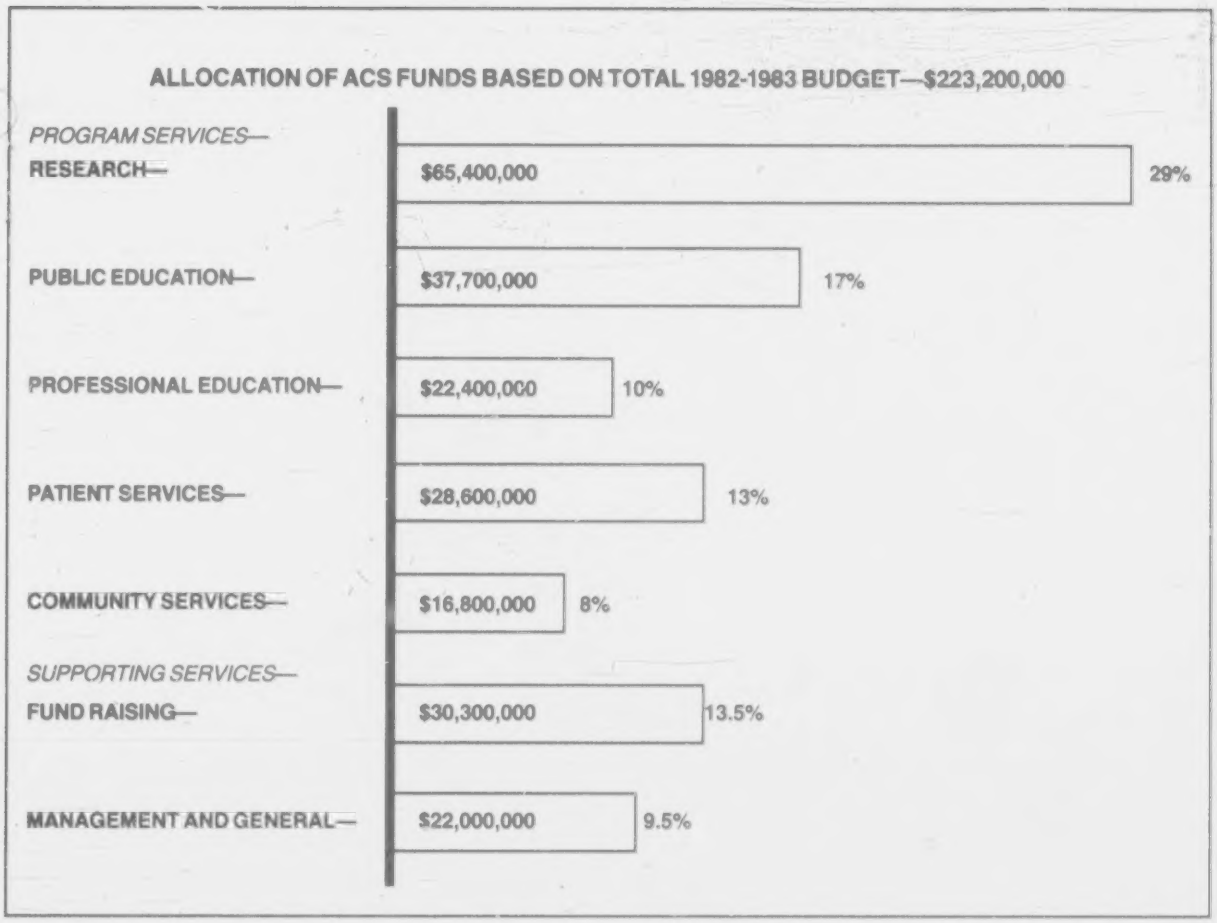
A winner of the 1980 Nobel Prize in Medicine was former ACS grantee Baruj Benacerraf, M.D. ACS Research Professors Drs. David Baltimore and Howard Temin shared the 1975 Nobel Prize for Medicine with Dr. Renato Dulbecco, a former ACS grantee, for their work in viruses and genetics.

Other Nobel-winning investigators who received ACS funding include: Drs. Daniel Nathans and Hamilton O. Smith, 1978; Dr. Salvador Luria, 1969; Dr. Robert W. Holley, 1968; Dr. Charles Huggins, 1966; Dr. Peyton Rous, 1966; Dr. James Watson, 1962; Dr. Severo Ochoa, 1959; Drs. George W. Beadle and Edward Tatum in 1958, and Dr. Fritz Lipmann, 1953.

HOW TO ESTIMATE CANCER STATISTICS LOCALLY

Community Population	Estimated No. Who are Alive, Cured of Cancer	Estimated No. Cancer Cases Under Medical Care in 1984	Estimated No. Who Will Die of Cancer in 1984	Estimated No. of New Cases in 1984	Estimated No. Who Will be Saved from Cancer in 1984	Estimated No. Who Will Eventually Develop Cancer	Estimated No. Who Will Die of Cancer if Present Rates Continue
1,000	10	5	1	3	1	280	180
2,000	20	11	4	7	3	560	360
3,000	30	16	5	10	4	840	540
4,000	40	21	7	13	5	1,120	720
5,000	50	26	9	16	6	1,400	900
10,000	100	52	18	33	12	2,800	1,800
25,000	250	131	45	79	30	7,000	4,500
50,000	500	162	90	158	59	14,000	9,000
100,000	1,000	525	180	325	122	28,000	18,000
200,000	2,000	1,050	360	650	244	56,000	36,000
500,000	5,000	2,625	900	1,575	590	140,000	90,000

NOTE: The figures can only be the roughest approximation of actual data for your community. It is suggested that every effort be made to obtain actual data from a Registry source.



Figures taken from 1982 Annual Report

CANCER'S 7 WARNING SIGNALS

Change in bowel or bladder habits

A sore that does not heal

Unusual bleeding or discharge

Thickening or lump in breast or elsewhere

Indigestion or difficulty in swallowing

Obvious change in wart or mole

Nagging cough or hoarseness

If YOU have a warning signal, see your doctor!

SUMMARY OF RESEARCH GRANTS & FELLOWSHIPS AWARDED BY ACS (NATIONAL SOCIETY & DIVISIONS) DURING FISCAL YEAR ENDED AUGUST 31, 1983
(SUBJECT TO AUDIT)

Alabama, University of, Birmingham	(5)	543,487.00
Albany Medical Coll. of Union University, Albany, N.Y.	(2)	154,621.00
Arizona University, Tucson	(3)	271,526.00
Baylor College of Medicine, Houston, Tex.	(6)	597,517.00
Beth Israel Hospital, Boston, Mass.	(3)	285,750.00
Boston University, Boston, Mass.	(4)	224,843.00
Brandeis University, Waltham, Mass.	(4)	208,000.00
Brigham and Women's Hospital, Boston, Mass.	(1)	14,000.00
Brigham Young University, Provo, Utah	(1)	124,950.00
Brown University, Providence, R.I.	(4)	303,675.00
California Institute of Technology, Pasadena, Calif.	(4)	257,356.00
California, U. of, Calif. (Various Locations)	(63)	5,685,304.00
Cambridge University, England	(1)	16,000.00
Cancer Research Inc., New York, N.Y.	(1)	94,600.00
Carnegie Institute of Washington, Baltimore, Md.	(3)	144,200.00
Case Western Reserve University, Cleveland, Ohio	(6)	586,275.00
Chicago Medical School, Ill.	(1)	24,540.00
Chicago, University of, Ill.	(10)	815,125.00
Children's Cancer Research Foundation, Boston, Mass.	(3)	379,408.00
Children's Orthopedic Hospital Medical Center, Seattle, Wash.	(2)	230,000.00
Cincinnati, University of, Ohio	(5)	569,081.00
Clark University, Worcester, Mass.	(1)	37,428.00
Cold Spring Harbor Lab, Cold Spring Harbor, N.Y.	(2)	92,000.00
Colorado, University of, Boulder	(12)	759,355.00
Columbia University, New York, N.Y.	(7)	520,817.00
Connecticut, University of, Storrs	(2)	74,339.00
Cornell University, Ithaca, N.Y.	(1)	53,500.00
Cornell University, New York, N.Y.	(1)	61,500.00
Dana-Farber Cancer Institute, Boston, Mass.	(14)	797,239.00
Dartmouth College, Hanover, N.H.	(3)	210,912.00
Denver, University of, Denver, Colo.	(1)	100,000.00
Duke University, Durham, N.C.	(3)	211,000.00
Eleanor Roosevelt Inst. for Cancer Research, Denver, Colo.	(1)	10,000.00
Florida, University of, Gainesville	(6)	546,504.00
Fred Hutchinson Cancer Res. Ctr., Seattle, Wash.	(7)	777,296.00
George Washington University, Washington, D.C.	(3)	309,675.00
Georgetown University, Washington, D.C.	(1)	63,820.00
Georgia State University, Atlanta	(1)	155,000.00
Hahnemann Medical College, Philadelphia, Pa.	(2)	30,000.00
Harbor-UCLA Med. Center, Torrance, Calif.	(2)	57,600.00
Harvard University, Boston, Mass.	(15)	1,344,394.00
Hawaii, University of, Honolulu	(4)	288,216.00
Hunter College Organized Research, New York, N.Y.	(1)	80,887.00
Illinois, University of, Urbana	(2)	183,109.00
Imperial Cancer Res. Fund, England	(1)	32,800.00
Institute for Cancer Res., Philadelphia, Pa.	(4)	409,575.00
Institute for Medical Research, N.J.	(1)	21,709.00
Iowa, State University of, Iowa City	(1)	40,000.00
Jackson Laboratory, Bar Harbor, Me.	(1)	91,555.00
Jefferson Medical College, Philadelphia, Pa.	(1)	87,413.00
Johns Hopkins University, Baltimore, Md.	(13)	1,047,768.00
Kansas State University, Manhattan	(1)	91,457.00
Kansas, University of, Lawrence	(3)	106,336.00
Kentucky, University of, Lexington	(2)	222,654.00
La Jolla Cancer Research Foundation, La Jolla, Calif.	(1)	16,000.00
Long Island College Hospital, Brooklyn, N.Y.	(1)	94,600.00
Louisiana State University, Baton Rouge	(4)	354,375.00
Louisville, University of, Louisville, Ky.	(1)	27,500.00
Maryland, University of, Baltimore	(4)	294,500.00
Massachusetts General Hospital, Boston	(3)	265,500.00
Massachusetts Health Res. Inst., Inc., Boston, Mass.	(1)	99,671.00
Massachusetts Institute of Technology, Cambridge	(15)	1,197,997.00
Massachusetts, University of, Amherst	(1)	30,000.00
Mayo Foundation, Rochester, Minnesota	(1)	92,998.00
Medical College of Wisconsin, Milwaukee	(1)	58,125.00
Miami, University of, Coral Gables, Fla.	(1)	35,000.00
Michigan State University, East Lansing	(3)	221,000.00
Michigan, University of, Ann Arbor	(4)	343,000.00
Minnesota, University of, Minneapolis	(3)	183,941.00
Mississippi, University of, Jackson	(1)	20,000.00
Mount Sinai School of Medicine, New York, N.Y.	(4)	670,267.00
National Academy of Sciences, Washington, D.C.	(1)	31,000.00
Nat. Inst. of Allergy and Infect. Dis., Bethesda, Md.	(1)	32,600.00
Nat. Inst. of Arthritis and Metabol. Dis., Bethesda, Md.	(1)	30,142.00
Nat. Jewish Hosp. and Res. Ctr., Colo.	(3)	209,013.00
Nat. Soc. for Med. Res., Washington, D.C.	(1)	10,000.00
NCI-Lab of DNA Tumor Virus	(1)	24,000.00
New England Reg. Primate Res. Ctr., Mass.	(1)	63,000.00
New Jersey Medical School, N.J.	(1)	25,000.00
New Mexico State University, Las Cruces	(1)	47,111.00
New York Academy of Sciences, New York, N.Y.	(1)	10,000.00
New York University, New York, N.Y.	(12)	2,065,177.00
North Carolina, University of, Chapel Hill	(6)	511,635.00
Northwestern University, Chicago, Ill.	(4)	264,373.00
Oak Ridge Assoc. Univ. Inc., Oak Ridge, Tenn.	(1)	79,221.00
Ohio State University, Columbus	(1)	30,000.00
Oregon State College, Corvallis	(3)	151,375.00
Oregon, University of, Eugene	(3)	158,352.00
Pennsylvania Hospital, Philadelphia	(1)	34,250.00
Pennsylvania State University, University Park	(9)	1,472,559.00
Pennsylvania, University of, Philadelphia	(7)	390,712.00
Peter Bent Brigham Hospital, Boston, Mass.	(1)	175,883.00
Pittsburgh, University of, Pittsburgh, Pa.	(5)	396,462.00
Princeton University, Princeton, N.J.	(6)	569,500.00
Public Health Research Institute, New York, N.Y.	(2)	172,140.00
Purdue University, Lafayette, Ind.	(3)	175,542.00
Res. Foundation for Mental Hygiene Inc., New York, N.Y.	(1)	10,000.00
Rhode Island Hospital, Providence	(2)	180,244.00
Rochester, University of, Rochester, N.Y.	(5)	477,755.00
Rockefeller University, New York, N.Y.	(7)	509,331.00
Roger Williams General Hospital, Providence, R.I.	(1)	108,038.00
Roswell Park Memorial Institute, Buffalo, N.Y.	(13)	1,209,169.00
Rutgers State Univ. of New Jersey, New Brunswick	(2)	173,744.00
Salk Institute for Biological Studies, San Diego, Calif.	(5)	243,524.00
San Diego State College, San Diego, Calif.	(1)	155,000.00
Scripps Clinic Research Foundation, La Jolla, Calif.	(3)	223,964.00
Sloan-Kettering Institute for Cancer Research, New York, N.Y.	(18)	1,820,058.00
Sloan-Kettering Institute, Westchester, N.Y.	(4)	412,082.00
South Carolina, University of, Columbia	(2)	106,000.00
Southern California, University of, Los Angeles	(9)	1,056,944.00
Southern Research Institute, Birmingham, Ala.	(2)	252,308.00
St. Jude Children's Research Hospital, Memphis, Tenn.	(4)	432,500.00
St. Louis University, St. Louis, Mo.	(2)	85,000.00
Stanford University, Stanford, Calif.	(23)	1,513,550.00
State University of New York at Albany, N.Y.	(2)	156,190.00
State University of New York, Brooklyn, N.Y.	(2)	234,013.00
State University of New York, Buffalo, N.Y.	(3)	242,681.00
State University of N.Y. at Stony Brook	(15)	1,185,811.00
Syracuse University, Syracuse, N.Y.	(2)	92,720.00
Temple University, Philadelphia, Pa.	(1)	60,430.00
Tennessee, University of, Memphis	(1)	70,846.00
Texas, University of, Texas (Various Locations)	(26)	2,172,198.00
Trudeau Institute Inc., Saranac Lake, N.Y.	(2)	254,919.00
Tufts University, Medford, Mass.	(5)	385,665.00
Tulane University, New Orleans, La.	(1)	25,000.00
Université Louis Pasteur Faculté de Medecine, France	(1)	33,400.00
University Hospital, Boston, Mass.	(2)	212,191.00
University of Vermont Reg. Cancer Ctr., Burlington, Vt.	(1)	202,312.00
University of Zurich, Switzerland	(1)	33,194.00
Utah, University of, Salt Lake City	(4)	386,713.00
Vanderbilt University, Nashville, Tenn.	(6)	273,500.00
Vermont, University of, State Agric. College, Burlington	(1)	100,463.00
Veterans Administration Hospital, Bronx, N.Y.	(1)	36,800.00
Virginia, Medical College of, Richmond	(2)	116,157.00
Virginia Polytechnic Inst. and State Univ., Blacksburg, Va.	(1)	129,217.00
Virginia, University of, Charlottesville	(8)	794,980.00
Wake Forest College, Winston-Salem, N.C.	(3)	256,546.00
Washington State University, Pullman	(1)	25,000.00
Washington, University of, Seattle	(8)	491,388.00
Washington University, St. Louis, Mo.	(6)	495,040.00
Wayne State University, Detroit, Mich.	(1)	57,312.00
West Fla. Cancer Research Fdtn., Inc., Pensacola, Fla.	(1)	14,442.00
West Virginia University, Morgantown	(2)	45,747.00
Whitehead Inst. Bio-Med. Res., Cambridge, Mass.	(2)	50,000.00
Whittier Inst. for Diabetes and Endocrinology, La Jolla, Calif.	(1)	40,249.00
Wisconsin, University of, Madison	(9)	720,696.00
Wistar Inst. of Anat. and Bio., Philadelphia, Pa.	(1)	110,000.00
Wyoming, University of, Laramie	(1)	155,000.00
Yale University, New Haven, Conn.	(23)	1,917,927.00
Yeshiva University, Bronx, N.Y.	(15)	1,266,525.00
Professional Programs of the UICC	(2)	515,000.00
Subtotal 646		54,132,563.00
Division Research Grants		2,500,000.00
Total		56,632,563.00

Note: Numbers in parentheses indicate number of grants per institution for the year ended August 31, 1983; totals subject to audit.

COMPREHENSIVE CANCER CENTERS

The institutions listed have been recognized as Comprehensive Cancer Centers by the National Cancer Institute. These centers have met rigorous criteria imposed by the National Cancer Advisory Board. They receive financial support from the National Cancer Institute, the American Cancer Society and many other sources.

ALABAMA
University of Alabama in Birmingham
Comprehensive Cancer Center
Lurleen Wallace Tumor Institute
1824 6th Avenue South
Birmingham, Alabama 35294
Phone: (205) 934-5077

CALIFORNIA
University of Southern California Comprehensive Cancer Center
1441 Eastlake Avenue
Los Angeles, California 90033-0804
Phone: (213) 224-6416

UCLA-Jonsson Comprehensive Cancer Center
Louis Factor Health Sciences Bldg.
10833 LeConte Avenue
Los Angeles, California 90024
Phone: (213) 825-5268

CONNECTICUT
Yale Comprehensive Cancer Center
Yale University School of Medicine
333 Cedar Street
New Haven, Connecticut 06510
Phone: (203) 785-4095

DISTRICT OF COLUMBIA
Georgetown University Howard University
Comprehensive Cancer Center

Vincent T. Lombardi Cancer Research Center
Georgetown University Medical Center
3800 Reservoir Road, N.W.
Washington, D.C. 20007
Phone: (202) 625-7721

Howard University Cancer Research Center
College of Medicine
Department of Oncology
2041 Georgia Avenue, N.W.
Washington, D.C. 20060
Phone: (202) 636-7697

FLORIDA
Comprehensive Cancer Center for
the State of Florida
University of Miami School of Medicine
1475 N.W. 12th Avenue
Miami, Florida 33101
Phone: (305) 545-770

ILLINOIS
Illinois Cancer Council
36 South Wabash Avenue, Suite 700
Chicago, Illinois 60603
Phone: (312) 346-9813

Northwestern University Cancer Center
303 East Chicago Avenue
Chicago, Illinois 60611
Phone: (312) 266-5250

University of Chicago Cancer Research Center
950 East 59th Street
Chicago, Illinois 60637
Phone: (312) 962-6180

University of Illinois
Department of Surgery, Division of Surgical Oncology
840 South Wood Street
Chicago, Illinois 60612
Phone: (312) 996-6666

Rush Cancer Center
Suite 820
1725 West Harrison Street
Chicago, Illinois 60612
(312) 942-6028

MARYLAND
Johns Hopkins Oncology Center
600 North Wolfe Street
Baltimore, Maryland 21205
Phone: (301) 955-8822

MASSACHUSETTS
Dana-Farber Cancer Institute
44 Binney Street
Boston, Massachusetts 02115
Phone: (617) 732-3555

MICHIGAN
Michigan Cancer Foundation
Meyer L. Prentis Cancer Center
110 East Warren Avenue
Detroit, Michigan 48201
Phone: (313) 833-0710

MINNESOTA
Mayo Clinic
200 First Street, S.W.
Rochester, Minnesota 55905
Phone: (507) 284-8964

NEW YORK
Columbia University Cancer Research Center
701 West 168th Street, Rm. 1208
New York, New York 10032
Phone: (212) 694-3647

Memorial Sloan-Kettering Cancer Center
1275 York Avenue
New York, New York 10021
Phone: (212) 794-6561

Roswell Park Memorial Institute
666 Elm Street
Buffalo, New York 14263
Phone: (716) 845-5770

NORTH CAROLINA
Duke Comprehensive Cancer Center
P.O. Box 3814
Duke University Medical Center
Durham, North Carolina 27710
Phone: (919) 684-2282

OHIO
Ohio State University Comprehensive Cancer Center
Suite 302
410 West 12th Avenue
Columbus, Ohio 43210
Phone: (614) 422-5022

PENNSYLVANIA
Fox Chase University of Pennsylvania Cancer Center

The Fox Chase Cancer Center
7701 Burholme Avenue
Philadelphia, Pennsylvania 19111
Phone: (215) 728-2781

University of Pennsylvania Cancer Center
3400 Spruce Street
7th Floor, Silverstein Pavilion
Philadelphia, Pennsylvania 19104
Phone: (215) 662-3910

TEXAS
The University of Texas System Cancer Center
M.D. Anderson Hospital and Tumor Institute
6723 Bertner Avenue
Houston, Texas 77030
Phone: (713) 792-6000

WASHINGTON
Fred Hutchinson Cancer Research Center
1124 Columbia Street
Seattle, Washington 98104
Phone: (206) 292-2930 or 292-7545

WISCONSIN
Wisconsin Clinical Cancer Center
University of Wisconsin
Department of Human Oncology
600 Highland Avenue
Madison, Wisconsin 53792
Phone: (608) 263-8610

CHARTERED DIVISIONS OF THE AMERICAN CANCER SOCIETY, INC.

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(602) 234-3266

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(501) 664-3480-1-2

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Wilmington, Delaware 19806
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1825 Connecticut Avenue, N.W.
Washington, D.C. 20009
(202) 483-2600

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Tampa, Florida 33609
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Atlanta, Georgia 30309
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200 North Vineyard Boulevard
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(808) 531-1662-3-4-5

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Boise, Idaho 83705
(208) 343-4609

Illinois Division, Inc.
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Chicago, Illinois 60603
(312) 372-0472

Indiana Division, Inc.
4755 Kingsway Drive, Suite 100
Indianapolis, Indiana 46205
(317) 257-5326

Iowa Division, Inc.
Highway #18 West
P.O. Box 980
Mason City, Iowa 50401
(515) 423-0712

Kansas Division, Inc.
3003 Van Buren Street
Topeka, Kansas 66611
(913) 267-0131

Kentucky Division, Inc.
Medical Arts Bldg.
1189 Eastern Parkway
Louisville, Kentucky 40217
(502) 459-1867

Louisiana Division, Inc.
Masonic Temple Bldg., 7th Floor
333 St. Charles Avenue
New Orleans, Louisiana 70130
(504) 523-2029

Maine Division, Inc.
Federal and Green Streets
Brunswick, Maine 04011
(207) 729-3339

Maryland Division, Inc.
200 East Joppa Road
Towson, Maryland 21204
(301) 828-8890

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247 Commonwealth Avenue
Boston, Massachusetts 02116
(617) 267-2650

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Lansing, Michigan 48906
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345 North Main Plaza
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6725 Lyons Street, P.O. Box 7
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  (212) 586-8700
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Raleigh, North Carolina 27611
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Fargo, North Dakota 58102
(701) 232-1385

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Cleveland, Ohio 44115
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Oklahoma City, Oklahoma 73112
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Oregon Division, Inc.
0330 S.W. Curry
Portland, Oregon 97201
(503) 295-6422

Pennsylvania Division, Inc.
Route 422 & Sipe Avenue
P.O. Box 416
Hershey, Pennsylvania 17033
(717) 533-6144

- **Philadelphia Division, Inc.**
  21 South 12th Street
  Philadelphia, Pennsylvania 19107
  (215) 665-2900

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(Avenue Domenech 273
Hato Rey, P.R.)
GPO Box 6004
San Juan, Puerto Rico 00936
(809) 764-2295

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Providence, Rhode Island 02906
(401) 831-6970

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Columbia, South Carolina 29205
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Sioux Falls, South Dakota 57104
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Montgomery County Unit
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Silver Spring, Md. 20902
(301) 933-9350

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